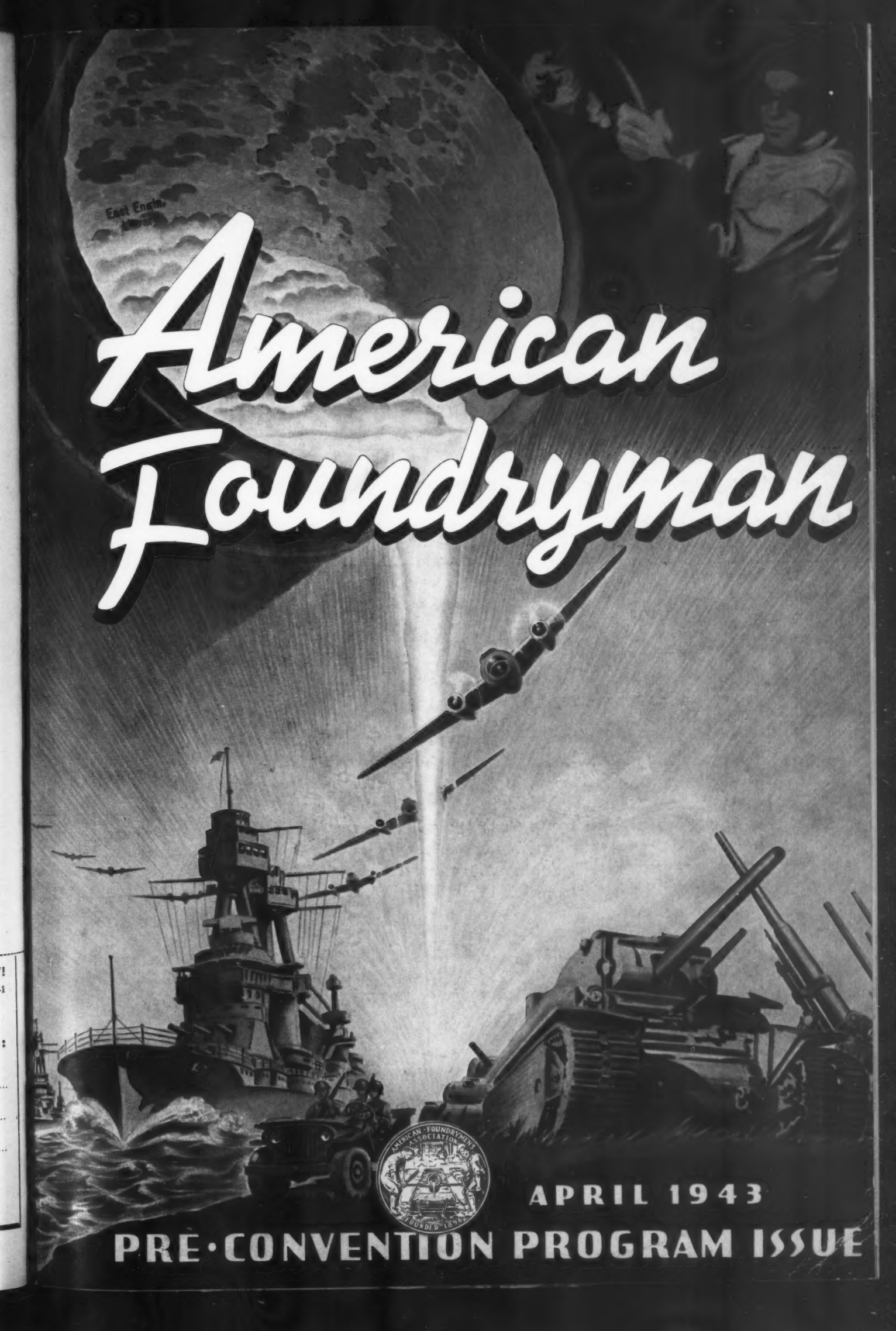
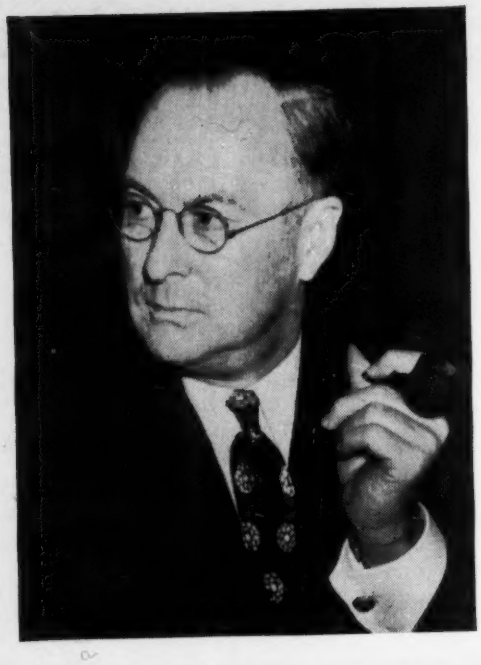


American Foundryman

AMERICAN FOUNDRYMEN'S ASSOCIATION · FOUNDED 1896

APRIL 1943

PRE-CONVENTION PROGRAM ISSUE



Donald Nelson

SENDS A MESSAGE TO THE FOUNDRY INDUSTRY

●

YOU, MR. FOUNDRYMAN, CAN FINISH THE JOB

TODAY American war industry has reached the stage where its plants have for the most part been built and it now stands ready in its great effort to produce the weapons for victory.

The "know-how" required to manufacture the complicated machinery of modern warfare has already been accumulated through experience by the nation's plant operators, technicians and workers. From now on your job and everyone else's job will be one of producing the things we need, whether castings or airplanes, at the fullest capacity. This capacity must apply not only to our industrial plants but also to each individual working at his utmost.

Each member of the foundry industry is playing an important part in this war effort and the country is looking to him to help bring about an early victory.

Donald M. Nelson

American Foundryman

A.F.A. OFFICERS AND DIRECTORS

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Rockford, Ill.

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W. L. WOODY
National Malleable & Steel Castings Co.,
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*Members Executive Committee

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Entered as second class matter July 22, 1938, at the post office at Chicago, Illinois, under the Act of March 3,1879.

FOUNDRY CONGRESS T

PROBLEMS in the major War Production Industries which includes the foundry, involve three major elements which might be known as the 3 M's—Men, Materials, and Machines. Many of the skilled men in industry are required for our armed forces. This means others must be trained to take their places. Materials are not as plentiful as we thought. This means where material shortages arise, others must be substituted. To do this accurately and to the best advantage, we must know not only the properties of various materials but also their proper manufacture. Machines which normally are plentiful, now are difficult to get. Therefore, we must conserve those machines which we have through maintenance and proper application. We must also rebuild and revamp our plants to take care of these deficiencies yet increase our production.

Industry to Gather at Congress

It is with the thought of providing information on personnel training, on properties and production processes, and on the proper conservation and application of machines for production that the Second War Production Foundry Congress will get under way in St. Louis on April 28, continuing until April 30. The Congress will provide a second opportunity since the war began for foundrymen from all over the country to gather and exchange ideas, receive help to solve their particular problems, and become informed on the progress that has been made throughout the castings industry in the production of war materiel.

From the opening session on Wednesday morning, which will hear a message by Col. Merle H. Davis, District Chief, St. Louis Ordnance District, to the final session on Friday evening, each meeting has been planned to provide as much information on the various phases of castings production as possible. The limited time which production men can take away from their plants also has been considered. As a result, the Congress will compress into three days a vast amount of information, the presentation of which ordinarily would require nearly a week. The program has been arranged in such a manner that few of those attending need be away from their plants more than two days to attend the meetings in which they are interested.

To make this possible, sessions of interest to malleable and to aluminum and magnesium foundrymen are scheduled for the first two days. Patternmakers will meet on the second day. Brass and bronze foundrymen and those interested in steel castings production will hold sessions on the second and third days. Sessions on gray iron subjects will be presented during the three Congress days.

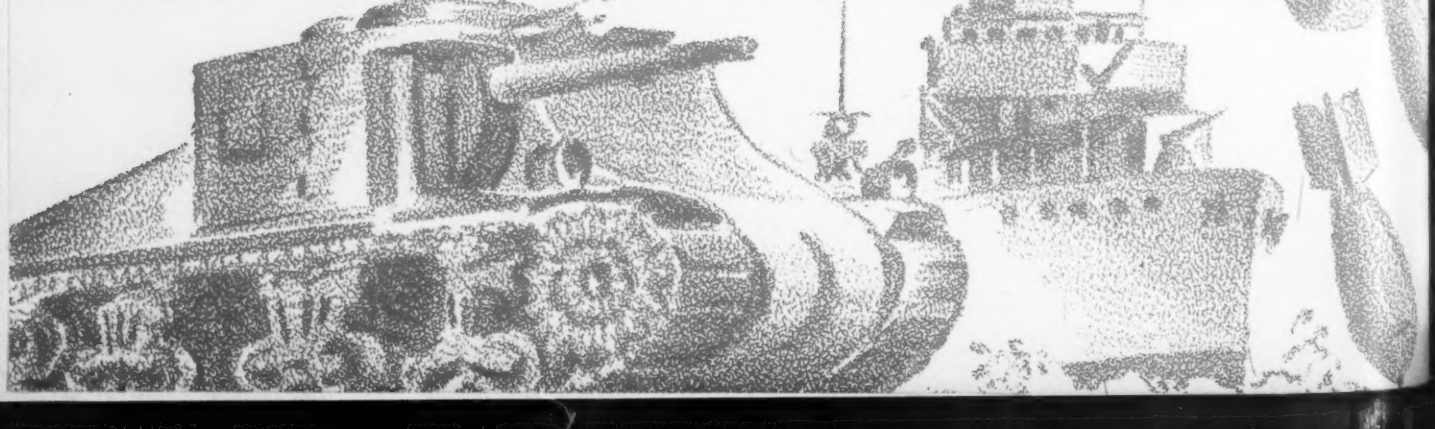
In addition, subjects of general interest such as apprentice and foreman training, job evaluation and time study, foundry costs, safety and hygiene, sand control and research, and refractories are scattered throughout the 3-day program. Several "off the record" sessions on vital war problems will be held. Every effort is being made to provide foundrymen attending with an incentive to use the sessions of the Congress for the solution of any problems that may exist in their plants.

Malleable Iron

As shown by the tentative program of sessions for this Second War Production Foundry Congress, given on the succeeding pages, the malleable division, under the chairmanship of A. M. Fulton, Northern Malleable Iron Co., St. Paul, Minn., will hold a three-session symposium on melting practices for malleable iron. The symposium will cover melting with all types of fuel now in use and in the various types of furnaces. Various methods of duplexing also will be discussed. A similar symposium on graphitization was held at the 1942 Congress.

Aluminum-Magnesium

This year, for the first time, a complete program has been arranged for producers of light alloy castings. These sessions are sponsored by



T EVELOP "Knowhow" IN WAR CASTINGS PRODUCTION

the newly organized Aluminum-Magnesium Division of which Dr. N. E. Woldman, Eclipse Aviation Div., Bendix Aviation Corp., Bendix, N. J., is chairman. The subjects to be covered include recommended practices for both aluminum and magnesium alloys, fluoroscopic examination of such castings, thermal gradients in cores for magnesium castings and control of inhibitors in magnesium sands.

Gray Iron

Of special interest to gray iron foundrymen should be the symposium on "Gray Iron as an Engineering Material," being sponsored by the Gray Iron Division of which F. J. Walls, International Nickel Co., Inc., Detroit, is chairman. In addition to discussions on the various engineering properties, such as endurance limit, dampening capacity, impact, modulus of elasticity, compression, torsion, tension and transverse strengths and deflection, by well-known authorities, such subjects as the relation between microstructure and properties, wear resistance and heat treatment will be thoroughly covered. The high-spot of the symposium will be presentation of the results of a survey conducted by the War Metallurgy Committee of the National Academy of Sciences, National Research Council, on the properties and applications of cast iron at temperatures above 450°F.

Brass and Bronze

The program of the Brass and Bronze Division, of which W. Romanoff, H. Kramer & Co., Chicago, is chairman, will feature the presentation of several recommended practices dealing with copper-base alloys widely used for the production of war castings. The alloys to be covered include the manganese, aluminum and silicon bronzes. Of special interest will be the symposium on manganese bronze, one of the most widely used alloys for war castings. Featured also will be a paper on the centrifugal casting of copper-base alloys.

Steel

Interest in the sessions of the steel division, under the chairmanship of C. E. Sims, Battelle Memorial Institute, Columbus, Ohio, will center around the wide variety of subjects on which papers will be presented. These include a paper on the results of using aluminum in 1000 steel heats, and others on heat treatment of moderately-heavy-section medium-carbon steel castings, atmospheric pressure in blind risers, stress relief in steel castings and factors which influence the ductility of cast steel.

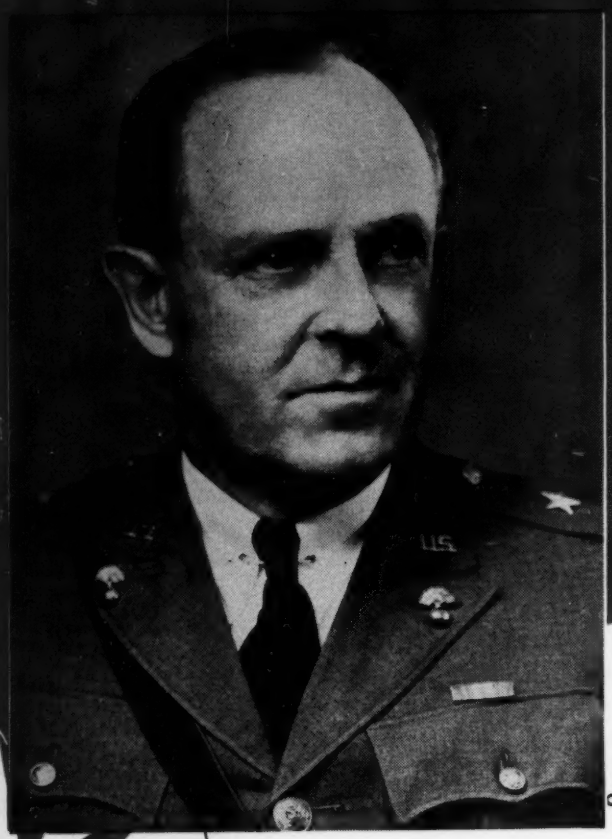
Patternmaking

The program of the patternmaking division, of which Vaughan Reid, City Pattern Works, Detroit, is chairman, also covers a variety of subjects from job analysis and time study as applied to patternmaking to pattern coatings and insurance.

General Interest Committees

The general interest committees, under their respective chairmen, are presenting sessions containing a wealth of information on subjects of vital interest during this time of National stress. Chairmen of the various committees which prepared these programs are as follows:

R. L. Lee, Grede Foundries, Inc., Milwaukee, Foundry Cost Committee; J. G. Goldie, Cleveland Trade School, Cleveland, Ohio, Apprentice Train-



General Campbell LOOKS AT THE FOUNDRY WAR EFFORT

BE ACCOMPANIED BY CARBON COPY AND ADDRESSED TO

WAR DEPARTMENT
CE OF THE CHIEF OF ORDNANCE
WASHINGTON, D. C.

March 11, 1943

Mr. D. P. Forbes
President
American Foundrymen's Association
222 West Adams Street
Chicago, Illinois

Dear Mr. Forbes:

Thank you so much for your letter of March 3rd with its gracious invitation for me to again address the Foundry War Production Congress. I well remember our meeting in Cleveland last year because it left a very vivid impression with me of the splendid work being done by your great organization. During the year past, I have had occasion to revise that estimate upward!

Need I say how sorry I am that I cannot be with you for this year's meeting in St. Louis on April 30th. My schedule for that time is filled, but if I might take the liberty, I would like to ask that you invite in my stead Colonel Merle H. Davis, Chief of the St. Louis Ordnance District, who is one of our best qualified officers. I am sure that his message to your associates will be of interest and value. I would like to hear him give it myself.

With renewed thanks,

Cordially yours,

L. H. CAMPBELL, Jr.
Major General, Chief of Ordnance

A.F.A. has been fortunate in securing Col. Merle H. Davis of the St. Louis Ordnance District to address the Opening Session of the St. Louis Congress, April 28. Due to the whole-hearted cooperation of Colonel Davis, both the Hon. Dwight Griswold, Governor of Nebraska, and Lt. Col. Joseph M. Colby, Ordnance Department, have accepted invitations to address the Annual A.F.A. Dinner, April 30.

Special Congress Speakers

Col. Merle H. Davis
District Chief, St. Louis Ordnance District
"Trends in the Use of Ordnance Items"

Miss Sara Southall,
Supervisor of Employment, International Harvester Co., Chicago
"Training Women for Industry"

Hon. Dwight Griswold,
Governor of Nebraska, Annual Dinner Speaker
"Industry Fights a War"

(Continued from Page 3)

ing Committee; W. G. Conner, Jr., Walworth Co., Washington Park, St. Clair County, Mo., Foreman Training Committee; F. E. Wartgow, American Steel Foundries, East Chicago, Ind., Job Evaluation and Time Study Committee; James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind., Plant and Plant Equipment Committee; J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala., Refractories Committee; Dr. H. Ries, Cornell University, Ithaca, N. Y., Foundry Sand Research Committee; E. E. Woodliff, Foundry Sand Service Engineering Co., Detroit, Sand Shop Operation Course Committee; F. G. Sefing, International Nickel Co., Inc., New York, Committee on Cooperation with Engineering Schools; and James R. Allan, International Harvester Co., Chicago, Industrial Hygiene Codes Committee.

Personnel Training for War Production. With the critical manpower situation as exists, personnel training occupies an important position in the program. Foreman training will be discussed at one session and apprentice and accelerated training in another. Training women for industry will be the subject at a special session. Representatives of government war training units of the Training Within Industry Division, War Manpower Commission, will participate in several of the discussions on personnel problems. Those interested in foundry education in colleges and universities will be interested in the session provided by the Committee on Cooperation with Engineering Schools where "Engineers in the Foundry Industry" will be discussed.

Costs. The Foundry Cost Committee is sponsoring a session devoted to the principles for determining costs under government contracts.

Job Evaluation. Job evaluation and time study as applied to the foundry will be the subject for a round table held by the committee on that subject with the Job Methods Training program of the Within Industry Division, W.M.C., being demonstrated.

Sand Research. The Foundry Sand Research meeting will hear papers on the elevated temperature properties of cores and coremaking materials, the use of southern bentonite in the steel foundry and the causes of "burnt-in" sand.

Refractories. In line with the general conservation of materials program, that subject as it applies to refractories will be discussed at the session sponsored by the Refractories Committee.

Plant and Plant Equipment. The Plant and Plant Equipment Committee will sponsor a session, which in addition to discussing core sand reclamation and the use of infra-red lamps for core and mold drying, will emphasize the important subject of foundry maintenance during war time.

Safety and Hygiene. Safety and hygiene information for non-ferrous, and more especially light-alloy, foundries will feature the program developed by the Safety and Hygiene Committee. The subjects to be covered include fire prevention and control in magnesium foundries, safety and hygiene problems in aluminum and magnesium foundries, and the engineering aspects of collecting dust and fumes in non-ferrous foundries. Presentation of papers on these subjects

(Concluded on Page 16)

A PROGRAM OF WAR PRODUCTION

WEDNESDAY, APRIL 28

8:30 AM—Registration, Hotel Jefferson.

10:00 AM—Opening Session.

Presiding—D. P. Forbes, President, American Foundrymen's Association.

Vice Chairman—L. C. Wilson, Vice-President, American Foundrymen's Association.

President's Annual Address.

Address by Col. Merle H. Davis, District Chief, St. Louis Ordnance District—*Trends in the Use of Ordnance Items.*

12:30 PM—Malleable Division Round-Table Luncheon.

Presiding—A. M. Fulton, Northern Malleable Iron Co., St. Paul, Minn.

Co-Chairman—R. J. Teetor, Cadillac Malleable Iron Co., Cadillac, Mich.

"Information Please."

Discussion Leader—J. H. Lansing, Malleable Founders' Society, Cleveland.

2:00 PM (1)—Aluminum and Magnesium Founding.

Presiding—Dr. N. E. Woldman, Eclipse Aviation-Pioneer Instrument Div., Bendix Aviation Corp., Bendix, N. J.

Co-Chairman—B. D. Claffey, Gray Iron and Aluminum Div., General Malleable Corp., Waukesha, Wis.

Recommended Practices for Magnesium Foundry Alloys—Committee Report.

Chemical Analyses of Sands for Magnesium Castings, by E. W. Cramer, Washington State College, Mining Experiment Station, Pullman, Wash.

Temperatures Developed in Sand Cores During Casting of Magnesium Alloys, by A. T. Peters and M. V. Chamberlin, Dow Chemical Co., Midland, Mich.

2:00 PM (2)—Molding and Coremaking.

Presiding—M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill.

Core Blowing, by Z. J. Madacey, Caterpillar Tractor Co., Peoria, Ill.

Heavy Gray Iron Castings Produced by Modern Controlled Methods, by Samuel Appelby, Buffalo Foundry & Machine Co., Buffalo, N. Y.

2:00 PM (3)—Foundry Costs.

Presiding—R. L. Lee, Grede Foundries, Inc., Milwaukee, Wis.

Co-Chairman—John A. Wagner, Wagner Malleable Iron Co., Decatur, Ill.

Round-Table Discussion of *Explanation of Principles for Determining Costs Under Government Contracts.*

Panel Leaders—Members of A.F.A. Cost Committee.

Report on *Review of Recommendations to Buyers of Castings,* by C. A. Davis, Caterpillar Tractor Co., Peoria, Ill.

J. H. Lansing

E. W. Cramer

A. T. Peters

M. V. Chamberlin

Z. J. Madacy

S. Appelby

FOR THE 1943 FOUNDRY CONGRESS

WEDNESDAY, APRIL 28 (Cont.)

4:00 PM (1)—Heading and Gating Castings (1st Section).

Presiding—W. G. Reichert, Newark, N. J.

Heading and Gating Aluminum Magnesium Castings.

Discussion Leader—R. E. Ward, Eclipse Aviation Div., Bendix Aviation Corp., Bendix, N. J.

4:00 PM (2)—Job Evaluation and Time Study.

Presiding—Frank E. Wartgow, American Steel Foundries, East Chicago, Ind.

Co-Chairman—W. E. George, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.

Secretary—C. E. Rowe, MacDonald Bros., Inc., Chicago.

Panel Discussion of *Time Study and Job Evaluation as Applied to the Foundry.*

Panel Leaders:

E. L. Berry, Link-Belt Co., Chicago.

E. J. Metzger, Falcon Bronze Co., Youngstown, Ohio.

J. A. Westover, Dyer Engineers, Inc., Cleveland.

R. J. Wieland, Forest City Foundry Co., Cleveland.

L. W. Wallis, Trundle Engineering Co., Cleveland.

Job Methods Training (Demonstration), Training Within Industry Division, War Manpower Commission.

4:00 PM (3)—Gray Iron.

Presiding—F. J. Walls, International Nickel Co., Detroit.

Vice-Chairman—Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.

Cupola Combustion, by W. A. Pennington, Mellon Institute, Pittsburgh, Pa.

The Effect of Heat Treatment on the Physical Properties of Some Common Irons Used in Oil Field Equipment, by E. R. Starkweather, Lufkin Foundry Co., Lufkin, Texas.

Review of Spanish Study of Quenched Gray Cast Iron, by F. R. Morral, Pennsylvania State College, State College, Pa.

4:30 PM—Chapter Delegate Meeting.

Presiding—L. C. Wilson, Vice-President, American Foundrymen's Association.

Vice-Chairman—R. J. Teetor, Cadillac Malleable Iron Co., Cadillac, Mich.

6:30 PM (1)—Annual Dinner, Foundry Instructors in Engineering Schools.

Presiding—F. G. Sefing, International Nickel Co., New York.

Education and the Gray Iron Foundry—Address by W. W. Rose, Executive Vice-President, Gray Iron Founders' Society, Cleveland.

6:30 PM (2)—Annual Dinner, Chapter Officers and Directors.

Presiding—L. C. Wilson, Vice-President, American Foundrymen's Association.

Vice-Chairman—R. J. Teetor, Cadillac Malleable Iron Co., Cadillac, Mich.

J. A. Wagner

W. E. George

F. R. Morral

W. W. Rose

K. H. Priestley

PROGRAM • War Production Congress

WEDNESDAY, APRIL 28 (Contd.)

8:00 PM (2)—Sand Shop Course.

Presiding—F. S. Brewster, Dow Chemical Co., Midland, Mich.

Foundry Sands for Magnesium and Aluminum Castings.

Discussion Leaders:

W. F. Rose, Wright Aeronautical Corp., Paterson, N. J.

A. E. Cartwright, Robert Mitchell Co., Ltd., Montreal.

M. E. Gantz, American Magnesium Corp., Cleveland.

F. S. Brewster, Dow Chemical Co., Midland, Mich.

A. V. Lorsch, Eclipse Aviation Div., Bendix Aviation Corp., Bendix, N. J.

8:00 PM (1)—Gray Iron Shop Control.

Presiding—Kenneth Priestley, Eaton Manufacturing Co., Vassar, Mich.

Vice-Chairman—E. E. Marbaker, Pittsburgh, Pennsylvania.

Discussion Leader—George S. Evans, Mathieson Alkali Works, New York.

Slags, Fluxes, and Desulphurizers.

8:00 PM (3)—Special War Problems.

Presiding—W. J. Hebard, Director of Personnel, Continental Roll & Steel Foundry Co., East Chicago, Ind.

Training Women for Industry, by Miss Sara Southall, Supervisor of Employment, International Harvester Co., Chicago, and Consultant, War Manpower Commission.

THURSDAY, APRIL 29

9:30 AM—Business and Awards Meeting.

Presiding—D. P. Forbes, President, American Foundrymen's Association.

Vice-Chairman—L. C. Wilson, Vice President, American Foundrymen's Association.

Report of Officers.

Report of Election of Officers.

Election of 1944 Nominating Committee.

Medal Awards.

First A.F.A. Foundation Lecture: *Foundry Metallurgy and the Castings Industry*—Presented by John W. Bolton, The Lunkenheimer Co., Cincinnati.

12:30 PM—Aluminum and Magnesium Division Round-Table Luncheon.

Presiding—Dr. N. E. Woldman, Eclipse Aviation-Pioneer Instrument Division, Bendix Aviation Corp., Bendix, N. J.

Vice-Chairman—Leslie Brown, Magnesium Fabricators, Inc., Adrian, Mich.

E. R. Starkweather

E. E. Marbaker

F. S. Brewster

W. J. Hebard

L. Brown

A. T. Ruppe

Dr. H. A. Schwartz

J. A. Durr

A. Van Lantschoot

W. D. Walters

J. H. Hall

K. L. Clark

H. F. Taylor

H. F. Bishop

THURSDAY, APRIL 29 (Cont.)

Discussion Leaders—A. T. Ruppe, Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.

G. H. Starmann, Apex Smelting Co., Chicago, Ill.

2:00 PM (1)—Malleable Foundry Melting Symposium—(1st Section.)

Presiding—D. P. Forbes, President, Gunite Foundries Corp., Rockford, Ill., and President of A.F.A.

Co-Chairman—Carl F. Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

Introduction, by Dr. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.

Air Furnace—Pulverized Coal Fired, by J. A. Durr, Albion Malleable Iron Co., Albion, Mich.

Melting with Fuel Oil in the Air Furnace, by A. Van Lantschoot, Iowa Malleable Iron Co., Fairfield, Iowa.

2:00 PM (2)—Patternmaking.

Presiding—Vaughan Reid, City Pattern Works, Detroit.

Co-Chairman—Frank C. Cech, Cleveland Trade School, Cleveland.

Job Analysis and Predetermining of Time Values for Patternmaking, by W. D. Walters, Supervisor of Time Study, Feeder Div., Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Insurance Protection of Patterns, by W. C. Anderson, Missouri Inspection Bureau, St. Louis.

Metallizing as a Pattern Tool, by E. T. Parkinson, Metallizing Co. of America, Inc., Chicago.

Report on Pattern Coatings.

2:00 PM (3)—Steel Castings.

Presiding—R. A. Gezelius, General Steel Castings Corp., Eddystone, Pa.

Co-Chairman—John Howe Hall, General Steel Castings Corp., Eddystone, Pa.

Heat Treatment of Medium Carbon Cast Steel in Moderately Heavy Sections, by K. L. Clark, H. F. Bishop and H. F. Taylor, Naval Research Laboratory, Anacostia Station, Washington, D. C.

Quantity Production of Manganese Steel, by J. W. Gardom, Sheffield, England. Exchange Paper of Institute of British Foundrymen.

Report of Committee on Radiography—Presented by C. W. Briggs, Steel Founders' Society of America, Cleveland.

2:00 PM (4)—Gray Iron—Symposium on Gray Cast Iron as an Engineering Material. (1st Section).

Presiding—Dr. A. E. Schuh, U. S. Pipe & Foundry Co., Burlington, N. J., and War Metallurgy Committee, National Research Council, Washington, D. C.

PROGRAM • War Production Congress

C. W. Briggs

Dr. A. E. Schuh

T. E. Barlow

W. W. Edens

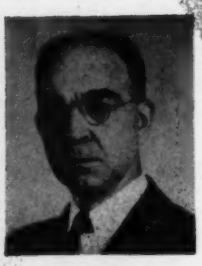
R. G. McElwee

J. S. Vanick

F. J. Wurscher

G. P. Halliwell

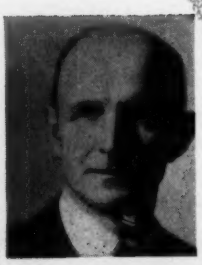
A. H. Hesse



L. J. Kelly

E. E. Woodliff

Chas. Morrison



C. A. Sleicher

P. T. Bancroft

H. K. Briggs

THURSDAY, APRIL 29 (Cont.)

Vice-Chairman—T. E. Barlow, Vanadium Corp. of America, Detroit.

Introduction of Symposium, by R. G. McElwee, Vanadium Corp. of America, Detroit, and War Production Board, Washington, D. C.

Report of Survey of High Temperature Properties and Applications, by T. E. Barlow, War Metallurgy Committee, and Vanadium Corp. of America, Detroit.

Heat Treatment of Cast Iron, by J. S. Vanick, International Nickel Co., New York.

4:00 PM (1)—Heading and Gating Castings (2d Section).

Presiding—W. G. Reichert, Newark, N. J.

Heading Steel Castings.

Discussion Leader—Fred B. Riggan, Key Company, E. St. Louis, Ill.

4:00 PM (2)—Brass and Bronze Founding.

Presiding—Wm. Romanoff, H. Kramer & Co., Chicago.

Vice-Chairman—W. W. Edens, Ampco Metals, Inc., Milwaukee, Wis.

Recommended Practice for Manganese Bronze—Committee Report. Presented by B. A. Miller, Cramp Brass & Iron Foundries Div., Baldwin Locomotive Works, Philadelphia.

Effect of Lead on Some of the Mechanical Properties of Manganese Bronze, by G. P. Halliwell, H. Kramer & Co., Chicago.

Lead in Manganese Bronze, by A. H. Hesse, Naval Research Laboratories, Anacostia Station, Washington, D. C.

4:00 PM (3)—Malleable Foundry Melting Symposium (2d Section).

Presiding—Dr. H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.

Co-Chairman—R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.

Air Furnace - Cupola Duplexing, by F. J. Wurscher, Acme Steel & Malleable Co., Buffalo, New York.

Cupola - Electric Duplexing, by Charles Morrison, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

Cupola Melting for Malleable Fittings, by H. W. Maack, Crane Co., Chicago.

Open Hearth Melting, by Leo J. Kelly, Fort Pitt Malleable Iron Co., Pittsburgh, Pa.

6:30 PM—Foundry Foremen Training Group, Dinner.

8:00 PM (1)—Foremen Training.

Presiding—W. G. Conner, Jr., Walworth Co., Washington Park, Ill.

Vice-Chairman—W. E. George, Campbell Wyant & Cannon Foundry Co., Muskegon, Michigan.

Panel Discussion—*Foreman Training.*

Job Relations Training—Training Within Industry Division, War Manpower Commission.

8:00 PM (2)—Sand Control Shop Course.

Presiding—E. E. Woodliff, Detroit, Mich.

Cement Molding Practices in a Gray Iron Shop, by C. Sleicher, New England Butt Co., Providence, R. I.

8:00 PM (3)—Gray Iron Shop Course.

Presiding—P. T. Bancroft, Republic Coal & Coke Co., Moline, Ill.

Vice-Chairman—E. E. Marbaker, Pittsburgh, Pennsylvania.

Carbon Control of Cupola Cast Iron—Discussion Leader, H. Kenneth Briggs, Miller & Co., Chicago.

Front Slagging Spout for Cupolas, by R. D. Petcher, Weil McLain Co., Michigan City, Indiana.

8:00 PM (4)—Malleable Foundry Melting Symposium (3d Section).

Presiding—C. F. Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Michigan.

Co-Chairman—J. H. Lansing, Malleable Founders' Society, Cleveland.

Brackelsberg Furnace Melting, by W. Zeunik and Kenneth Mason, National Malleable & Steel Castings Co., Indianapolis, Ind.

Refractories Practices for Malleable Furnaces, by C. A. Brashares, Harbison-Walker Refractories Co., Pittsburgh, Pa.

Practical Points in Malleable Melting, by J. H. Lansing, Malleable Founders' Society, Cleveland.

8:00 PM (5)—Aluminum and Magnesium Castings.

Presiding—Dr. N. E. Woldman, Eclipse Aviation-Pioneer Instrument Div., Bendix Aviation Corp., Bendix, N. J.

Co-Chairman—M. E. Brooks, Dow Chemical Co., Bay City, Mich.

Recommended Practice for Sand Cast Aluminum Alloys—Committee Report presented by H. J. Rowe, Aluminum Co. of America, Cleveland.

Fluoroscopic Examination of Light Alloy Castings, by A. E. Cartwright, Robert Mitchell Co., Ltd., Montreal, Canada.

Recent Improvements in Magnesium Melting and Aluminum Ladle Preheating Practice, by James Kniveton, Selas Co., Philadelphia.

8:00 PM (6)—Steel Castings.

Presiding—A. H. Jameson, Malleable Iron Fittings Co., Brandford, Conn.

Co-Chairman—H. H. Blosjo, Minneapolis Electric Steel Co., Minneapolis, Minn.

Cores for Steel Castings, by J. A. Duma and S. W. Brinson, Norfolk Navy Yard, Portsmouth, Va.

Converter Practice, by F. B. Skeates, Link-Belt Co., Chicago, and A. W. Gregg, Whiting Corp., Harvey, Ill.

PROGRAM • War Production Congress

A. W. Gregg

J. A. Duma

E. C. Troy

C. J. Freund

R. S. Falk

H. M. St. John

FRIDAY, APRIL 30

10:00 AM (1)—Steel Castings.

Presiding—C. E. Sims, Battelle Memorial Institute, Columbus, Ohio.

Co-Chairman—C. W. Briggs, Steel Founders' Society of America, Cleveland.

Use of Aluminum in 10,000 Steel Heats, by E. C. Troy, Dodge Steel Co., Philadelphia.

Report of Committee on Non-Destructive Testing—Presented by Committee Chairman R. A. Gezelius, General Steel Castings Corp., Eddystone, Pa.

Report of Committee on Methods of Producing Steel for Castings—Presented by Committee Chairman C. E. Sims, Battelle Memorial Institute, Columbus, Ohio.

10:00 AM (3)—Brass and Bronze.

Presiding—H. M. St. John, Crane Company, Chicago.

Co-Chairman—G. K. Dreher, Ampco Metal, Inc., Milwaukee, Wis.

Recommended Practices for Aluminum Bronze—Committee Report.

Recommended Practices for Silicon Bronzes—Committee Report presented by E. G. Jennings, Asst. Chief, Substitutions and Specifications Section, Office of Metals Controller, Dept. of Munitions and Supply, Ottawa, Canada.

Centrifugal Castings of Brass and Bronze, by H. B. Zuehlke, Allis-Chalmers Mfg. Co., Milwaukee, Wis.

10:00 AM (2)—Apprentice Training.

Presiding—C. J. Freund, Dean of Engineering, University of Detroit, Detroit.

The Second Generation in Apprentice Training, by Richard Falk, Falk Corp., Milwaukee, Wis.

Getting Results from Accelerated Training, by W. J. Hebard, Continental Roll & Steel Foundry Co., East Chicago, Ind.

10:00 AM (5)—Sand Research.

Presiding—J. B. Caine, Sawbrook Steel Castings Co., Lockland, Ohio.

Vice-Chairman—Dr. H. Ries, Ithaca, N. Y.

Elevated Temperature Studies of Foundry Cores and Coremaking Materials, by C. P. Albus and Emile Pragoff, Jr., Hercules Powder Co., Wilmington, Del.

Southern Bentonite in the Steel Foundry, by N. J. Dunbeck, Eastern Clay Products Co., Eifort, Ohio.

Causes of Burned-in Sand Condition in Steel Castings, by J. B. Caine, Sawbrook Steel Castings Co., Lockland, Ohio.

10:00 AM (4)—Cast Iron—Symposium on Gray Cast Iron as an Engineering Material (2d Section).

Presiding—V. A. Crosby, Climax Molybdenum Co., Detroit.

Vice-Chairman—George A. Timmons, Climax Molybdenum Co., Detroit.

Modulus of Elasticity, by A. J. Herzig, Climax Molybdenum Co., Detroit.

E. G. Jennings

H. B. Zuehlke

V. A. Crosby

G. A. Timmons

A. J. Herzig

Dr. J. T. MacKenzie

J. B. Caine

M. E. Brooks

C. P. Albus

T. D. West

E. Pragoff, Jr.

N. J. Dunbeck

D. F. O'Connor

H. D. Phillips

A. H. Jameson

FRIDAY, APRIL 30 (Cont.)

Impact Properties, by Dr. James T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Alabama.

Endurance Limits, by C. J. Tobin, General Motors Research Laboratories, Detroit.

Vibration Dampening, by F. J. Walls, International Nickel Co., Detroit.

12:30 PM (1)—Steel Division Round-Table Luncheon.

Presiding—T. D. West, Deere & Co., Moline, Illinois.

Atmospheric Pressures in Blind Feed Risers.

Chairman—R. S. Munson, Atlantic Steel Casting Co., Chester, Pa.

Discussion Leader—H. D. Phillips, Lebanon Steel Foundry Co., Lebanon, Pa.

Some Good and "Bad" Castings.

Chairman—A. H. Jameson, Malleable Iron Fittings Co., Branford, Conn.

Discussion Leader—S. W. Brinson, Norfolk Navy Yard, Portsmouth, Va.

Miscellaneous Topics—

Discussion Leaders—John Howe Hall, General Steel Castings Corp., Eddystone, Pa. G. A. Lilliequist, American Steel Foundries, East Chicago, Ind.

12:30 PM (2)—Brass and Bronze Division Round-Table Luncheon.

Presiding—B. A. Miller, Cramp Brass & Iron Foundries Div., Baldwin Locomotive Works, Philadelphia.

Recommended Practice for Temperature Control, by D. Frank O'Connor, Walworth Co., Greensburg, Pa.

12:30 PM (3)—Apprentice Committee Meeting and Luncheon.

2:00 PM (3)—Safety and Hygiene Section.

Presiding—James R. Allan, International Harvester Co., Chicago.

Fire Prevention and Control in Magnesium Foundries, by R. I. Thrune, Dow Chemical Co., Midland, Mich.

Mechanical Exhaustion of Fumes and Smoke, the Engineering Aspects of Collection of Dust and Fumes in Non-Ferrous Foundries and Industrial Operations, by John Kane, American Air Filter Co., Louisville, Ky.

Fumes and Dust—Discussion by Dr. E. M. Adams, Dow Chemical Co., Midland, Mich.

W. Zeunik

Kenneth Mason

C. A. Brashares

A. E. Cartwright

H. J. Rowe

A. K. Higgins

H. W. Maack

J. H. Lowe

F. M. McCarthy

C. E. Bales

R. S. Munson

W. E. Mahin

P. S. Lane

James Kniveton

W. A. Pennington

L. M. Duryee

D. Longueville

W. L. Hartley

E. Rominski

C. A. Zapffe

FRIDAY, APRIL 30 (Contd.)

Health Aspects of Safety and Hygiene Problems in Magnesium and other Foundries, by Warren Cook, Zurich General Accident and Liability Insurance Co., Ltd., Chicago.

Open Question and Answer Period—*Occupational Disease Problems.*

2:00 PM (1)—Foundry Refractories.

Presiding—J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala.

Vice-Chairman—C. E. Bales, Ironton Firebrick Co., Ironton, Ohio.

Conservation of Foundry Refractories, by F. McCarthy and C. E. Bales, Ironton Fire Brick Co., Ironton, Ohio.

Electric Furnace Refractories, by E. K. Pryor, Charles Taylor & Sons, Cincinnati.

Report of Committee on Cupola Refractories—Cupola Research Project.

2:00 PM (2)—Cast Iron—Symposium on Gray Cast Iron as an Engineering Material. (3d Section).

Presiding—John W. Bolton, The Lukenheimer Co., Cincinnati.

Vice-Chairman—John Lowe, Battelle Memorial Institute, Columbus, Ohio.

Relation of Microstructure to Properties, by W. E. Mahin, Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.

Compression and Torsion Properties, by F. G. Sefing and J. S. Vanick, International Nickel Co., New York.

Wear Resistance, by Paul S. Lane, Muskegon Piston Ring Co., Muskegon, Mich.

Transverse and Tension Strength and Deflection, by F. J. Walls, International Nickel Co., Detroit.

Closure of Symposium, by R. G. McElwee, Vanadium Corp. of America, Detroit.

4:00 PM (1)—Heading and Gating Castings (3d Section).

Presiding—W. G. Reichert, Newark, N. J.

Heading Iron Castings—

Discussion Leader—L. C. Thunfors, Caterpillar Tractor Co., Peoria, Ill.

4:00 PM (2)—Plant and Plant Equipment.

Presiding—James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind.

Infra Red Lamp Drying of Cores and Molds—Symposium with papers by:

L. M. Duryee, Connecticut Light & Power Co., Waterbury, Conn.

FRIDAY, APRIL 30 (Cont.)

E. H. Robinson, Lamp Dept., Nela Park Engineering Dept., General Electric Co., Nela Park, Ohio.

Core Sand Reclamation at Elevated Temperatures, by D. Longeuville, Wright Aeronautical Corp., Cincinnati and W. L. Hartley, Link-Belt Co., Chicago.

Discussion of Foundry Maintenance Under War Time Conditions.

4:00 PM (3)—Steel Foundry Practice.

Presiding—F. A. Melmoth, Detroit Steel Castings Co., Detroit, Mich.

Co-Chairman—H. D. Phillips, Lebanon Steel Foundry Co., Lebanon, Pa.

Stress Relief and the Steel Casting, by H. F. Taylor and E. Rominski, Naval Research Laboratory, Anacostia Station, Washington, D. C.

Hydrogen and Nitrogen as Causes of Gasiness in Ferrous Castings, by C. A. Zapffe and C. E. Sims, Battelle Memorial Institute, Columbus, Ohio.

Factors Influencing Ductility in Cast Steel, by G. A. Timmons, Climax Molybdenum Co., Detroit.

7:00 PM—Annual Dinner, American Foundrymen's Association.

Presiding—D. P. Forbes, President.

Address by Hon. Dwight Griswold, Governor of Nebraska.

"Industry Fights a War."

Address by Lt. Col. J. M. Colby, Ordnance Dept., U. S. Army.

"Performance of American Tanks on the Battle Field."

7:00 PM (1)—Shop Sand Control.

Presiding—F. B. Riggan, Key Co., East St. Louis, Ill.

Steel Shop Sand Control.

7:00 PM (2)—Gray Iron Shop Control

Presiding—H. H. Wilder, Washington, D. C.

Cupola Operation—

Discussion Leader—E. E. Marbaker, Mellon Institute, Pittsburgh, Pa.

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Foundrymen Get 'Know How' at War Production Congress

(Continued from Page 5)

will be followed by a question and answer period on occupational disease problems.

Special Features

Among the special features offered at the Second War Production Foundry Congress will be a series of lectures on gating and heading by W. G. Reichert, Reichert Engineering Co., Newark, N. J. Mr. Reichert has prepared lectures to cover practices for various ferrous and nonferrous alloys for this year's series. These lectures will be the first of a series on gating and heading which will be presented over a period of years and which will eventually be compiled into book form.

Another feature of special interest will be the first A.F.A. Foundation Lecture to be delivered by John W. Bolton, metallurgist, The Lunkenheimer Co., Cincinnati, Ohio, titled "Foundry Metallurgy and the Castings Industry." Mr. Bolton's wide knowledge of the foundry industry in its various phases together with his recognized ability in the metallurgical field assure that this lecture will have wide interest and appeal.

Educational Courses

The shop operation courses sponsored by the Gray Iron Division and the Sand Shop Courses, off-the-record discussions of practical foundry subjects presented in an understandable manner for the man in the shop, again occupy an important position in the technical program for the 1943 Second War Production Foundry Congress.

This year sand control in gray iron, steel, and magnesium foundries will be discussed at the Sand Shop Course sessions while the sessions of the Gray Iron Shop Course will feature presentation and discussion of sections of the Cupola Operation Handbook now being prepared by committees of the Cupola Research Project. Some of the subjects to be covered are slags, fluxes and deoxidizers, carbon control, front slagging spouts, and general cupola operation.

Annual Dinner

The annual dinner to be held Friday, April 30, will be of an entirely different character than those held previously. In keeping with the war spirit, it will be a serious affair, and there will be no dancing or entertainment following the dinner.

The Association, through the cooperation of Col. Merle H. Davis, District Chief, St. Louis Ordnance District, has been fortunate in securing two outstanding speakers for the event, the Hon. Dwight P. Griswold, Governor of Nebraska, and Lt. Col. Joseph M. Colby, Ordnance Department, U. S. Army. Governor Griswold, a straight-thinking and convincing speaker, has chosen for his subject "Industry Fights a War." Col. Colby, a West Point graduate and a specialist in the development of tank and combat vehicles, will speak on "Performance of American Tanks on the Battle Field." Col. Colby indeed knows his subject, as he has watched the performance of American tanks and other combat vehicles on maneuvers, at the proving grounds, and in combat in North Africa. He is highly regarded by the senior officers of the armored forces who have great confidence in his ability and soundness.

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ST. LOUIS HOSTS TO SECOND WAR PRODUCTION CONGRESS

Committees Aid Staging of Congress

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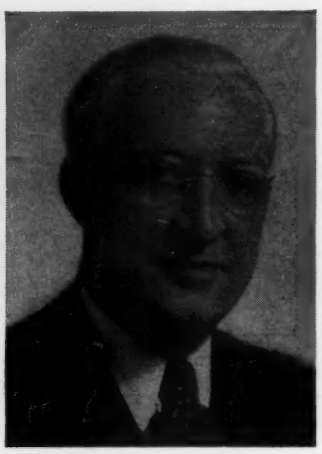

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Shoe Rationing Affects Foundry Safety Shoes

THE ration order issued by the Office of Price Administration regarding the rationing of shoes and restricting the purchase to three pairs per individual per year has caused considerable anxiety on the part of safety engineers with respect to obtaining safety shoes for the men in their shops. This was especially true among safety engineers in ship yards who took their problem to the Office of Price Administration. The OPA issued a bulletin to serve as a guide in solving the safety shoe problem that the previously mentioned order seems to present.

According to information received here, the OPA issued to all ration boards a directive interpreting the ration order. These boards are now empowered to issue certificates of necessity for the purchase of safety shoes to all industrial employees who require them. The employee may use his Ration Stamp 17 to purchase safety shoes. If he does this, he can obtain other types of shoes needed later by filling out a form and submitting it to the rationing board.

To overcome the various difficulties involved, it has been suggested that each company provide an application form which should be filled out by employees requiring safety shoes. The suggested type of form is shown in the accompanying box. This special certificate may be taken to the ration board by any member of the man's family or by his employer's representative. The employer may submit to the rationing board at any one time as many applications as he may have received. In cases where there are no safety engineers in the plants, the application form may be signed by any member of the company.

Application for Special Certificate for Shoes

To the Rationing Board.....
(City, Town or Village)

(1) This will certify that I.....have used
(Name of Applicant)
a stamp No. 17 in my War Ration Book No. 1.

(2) I do not have a Stamp No. 17 available to me in the book of any member of my family.

(3) I have less than two wearable or repairable shoes of the type needed or that I could use for the same purpose.

(4) I do not want these shoes for appearance purposes only as they are safety shoes of a special type and are needed in my work.

(5) The company I work for does not furnish me with shoes of the kind I need.

(6) I work for the.....
(Name and Address of Company Worked For)

.....

(7) .....
(Name of Applicant) (Address of Applicant)

Employer's Statement

I hereby certify that.....works
(Name of Applicant)
for the.....
(Name of Company)
at..... This employee has a
(Address of Company)
definite need for safety shoes in the type of work which he performs. I have questioned the applicant and it is my opinion that the information given above is true.

.....
(Safety Engineer)

THE CASTING INDUSTRY LOOKS AHEAD

WHEN the complete story can be told of the contributions of foundries to the war effort, it will be one of which we all can be very proud.

Our accomplishments have been the result of hard work and intelligent planning. It is not just luck that foundries have been able to switch from simple peace-time production to the exacting requirements of ordnance castings, nor is it luck that production has been raised to rates undreamed of even in boom times.

These results were possible only because the casting industry was staffed by energetic managers, trained technicians, and skilled workmen. If the American Foundrymen's Association has contributed, as we know it has, to the training of these men, its nearly fifty years of existence has been amply justified.

The demands of war production have shown, however, that as an industry we still have a long way to go before we realize our maximum potentialities. Castings can be improved; better metals can be developed; methods can be simplified, costs reduced.

No time should be lost in perfecting our aims in this direction. The war is still far from won and better performance of the industry may well be one of the factors which will bring speedier victory. Many experienced men have entered the casting industry and many more already engaged in foundry work have been advanced to positions of greater responsibility. How can the fund of accumulated knowledge in AFA files be made available to these men?

Many foundries inexperienced in the production of castings to exacting Army and Navy requirements have improved their production and control methods, sometimes against their will, with the result that vast improvement in quality is now easily maintained. Our military customers are gaining a new respect for the reliability and uniformity of castings.

Technical advances, many of which are still military secrets, have occurred not only in the chemistry and heat treatment of metals but also in the actual foundry production of metals. How can these day by day improvements be given industry-wide application except through close association of foundrymen?

It is a truism that war, horrible and wasteful as it may be, nevertheless carries with it advancement of knowledge in the arts and sciences, all of which contribute to the recovery of civilization when the war is over. It is important that our industry take advantage of this period of stress to build a sound basis for its future.

Measured by some standards, the casting industry has been slow, cautious, and seemingly reluctant to keep in the forefront of progress. Our record in the war effort is one of which we can be proud. We must maintain our gains and continue our advances. The American Foundrymen's Association, with its national organization and its intimate chapter groups, can, if it accepts the challenge, consolidate the gains stimulated by war necessity. Research and education, hand in hand, can guarantee a great future for our industry.

OFFICERS and DIRECTORS

L. C. Wilson
Vice President and Nominee for President

D. P. Forbes
President and Board of Directors Nominee

R. J. Teetor
Nominee for Vice President

D. P. FORBES

D. P. FORBES, president and general manager, Gunite Foundries Corp., Rockford, Ill., who is now serving as president of the Association, has been nominated for a three-year directorship. Prior to his election as president of A.F.A. last year, he served as vice president in 1941-42 and as a member of the Board of Directors from 1938-1940.

Mr. Forbes has been one of the most active members of A.F.A., particularly in the affairs of the malleable division of which he has served as chairman and has been a member since its organization in 1932. He is a member of the Technical Activities Correlation Committee and the Gray Iron Subcommittee on Specific Applications, and has been a member of several other committees. He has presented numerous papers and talks before both National and Chapter meetings, being one of the active sponsors of the Northern Illinois-Southern Wisconsin Chapter on whose Board of Directors he has served.

Mr. Forbes is a native of Rockford and comes from a long line of foundrymen. His great-grandfather, Duncan Forbes, was one of the pioneers in the production of malleable iron in America and established the present company of which Mr. Forbes is president in 1854.

Mr. Forbes received his higher education at Yale University, New Haven, Conn., from which he graduated in 1919. The following year he took post-graduate work at Yale, specializing in metallurgy. Later, he spent some time in the laboratory of Prof. Enrique Touceda, Albany, N. Y., studying malleable iron.

In 1921, he entered the employ of the Rockford Malleable Iron Works, Rockford, as a molder for about a year, and then was appointed a junior metallurgist. Later, he was appointed molding foreman and in 1925 was made works manager.

As a result of research work directed by Mr. Forbes, a process of producing high test gray iron was developed, using the air-furnace process of melting. The metal was given the trade name of "Gunite" and a separate company, the Gunite Corporation, was organized in 1928 to promote the manufacture and sale of the metal, with Mr. Forbes as president. Later he was elected to the presidency of the Rockford - Northwestern Malleable Corp. which became the Gunite Foundries Corp. in 1932.

L. C. WILSON

L. C. WILSON, general manager, Reading Steel Casting Div., American Chain & Cable Co., Inc., Reading, Pa., nominated for the presidency of A.F.A., now is serving as its vice president. Mr. Wilson is well qualified for this office as, in addition to serving as vice president, he has served as director of the A.F.A. for three years (1926-28) and has for many years been a member of the Steel Division Advisory Committee, chairman of the Division's committee on impact testing, has served as chairman of convention sessions and in many ways has been active in Association work. From a more technical viewpoint, his interest in testing methods has caused him to be appointed as A.F.A. representative on A.S.T.M. Committee E-1 on Methods of Testing.

Mr. Wilson secured his preparatory education in the schools of New Haven, Conn., and his technical training in the Sheffield Scientific School of Yale University, being graduated from this school in 1907 with a degree in mechanical engineering.

On completing his work at Yale, Mr. Wilson entered the sales department of the Har-

bison-Walker Refractories Co., representing this company over a period of years in its Pittsburgh, Chicago, New York and New England districts. Later, he joined the staff of the Chain Belt Co., Milwaukee, as assistant to the vice president, later being made general sales manager. Transferring to the Federal Malleable Co., Milwaukee, as secretary, Mr. Wilson was later elected vice president and general manager, which position he relinquished when he accepted his present affiliation with the Reading Steel Casting Division, American Chain & Cable Co.

RALPH J. TEETOR

RALPH J. TEETOR, who has been nominated for the vice presidency of the American Foundrymen's Association, is president, Cadillac Malleable Iron Co., Cadillac, Mich. His sustained activity in the work of the Association well qualifies him for that office. Mr. Teetor has been active in the affairs of the malleable division of A.F.A., having been a member of the Advisory and other committees. He has presented several papers before annual conventions and in other ways has participated in the work of the Association. Mr. Teetor also has served as a director of American Foundrymen's Association from 1933-1935.

Mr. Teetor comes from a family whose interests have been in the foundry industry. His higher education was obtained at Purdue University, Lafayette, Ind., from which he was graduated in 1905 with a degree in mechanical engineering. Following his graduation, he became associated with the Link Belt Co., Indianapolis, where he rose to the position of chief engineer. He resigned that position in 1915 to become secretary of the Standard Malleable Iron Co., Muskegon, Mich.

During the last World War, he served as major of infantry until December, 1918, and as division inspector until 1919 when he was discharged from the Army. He then became vice president and general manager of the Howe Chain Co., Muskegon, Mich., remaining there until 1921 when he became interested in the iron and lumber business in Cadillac, Mich. His interests in that locality led him to establish the Cadillac Malleable Iron Company where he became secretary and general manager, taking an active interest in the erection and operation of the plant. Later, he was elected to the presidency of this company, a position he now holds.

MAX KUNIANSKY

MAX KUNIANSKY, general manager, Lynchburg Foundry Co., Lynchburg, Va., has been nominated for a three-year directorship of the American Foundrymen's Association. Mr. Kuniansky has been one of the most active members of A.F.A., serving on a large number of committees, such as those on Gray Iron Castings, Pig Iron Qualities, Recommended Practices for Cupola Mixtures, and various others, including the Cupola Research Committee where he is serving as chairman of both the Finance Committee and the Subcommittee on Scrap. He is also interested in chapter affairs and is now serving as a member of the Board of Directors of the Chesapeake Chapter. His various contributions to the Association and the industry were recognized in 1941 when he was awarded the Wm. H. McFadden Gold Medal of A.F.A.

Mr. Kuniansky's career might be termed a typical American Odyssey. Born in Russia, he came to this country at an early age and entered the Georgia School of Technology, graduating in 1919 with a B.S. degree in engineering chemistry. Following his graduation, he was for a time connected with the Aetna Explosives Company, now the Hercules Powder Company, at the Birmingham, Ala., and Ishpening, Mich., plants. He also has been associated with the National Malleable & Steel Castings Company at its Chicago plant and with the American Cast Iron Pipe Co., Birmingham, Ala.

In 1923, he became associated with the Lynchburg Foundry Company as chief chemist, retaining that position until 1928 when he was made works manager. Later, he became general

manager of the company with headquarters at Lynchburg and with jurisdiction over both the Lynchburg and Radford, Va., plants.

In addition to his activities in A.F.A., Mr. Kuniansky has been prominent in the work of other technical and professional associations, particularly the American Society for Testing Materials.

ROY M. JACOBS

ROY M. JACOBS, president, Standard Brass Works, Milwaukee, has been nominated for a three-year directorship on the Board of Directors of the American Foundrymen's Association. Mr. Jacobs has taken an active interest in the affairs of the Association for a number of years. He has been particularly active in the Wisconsin Chapter of A.F.A., serving as its president in 1938-1939.

Mr. Jacobs has been connected with the foundry industry since he was 15 years old. While attending school, he worked after school, on Saturdays and during vacations, at the Standard Brass Works, from 1905 to 1912. He must have liked the foundry because after finishing his formal education, with the exception of about six months during 1912, when he served as commissary clerk on a railroad crew, he has been connected with the Standard Brass Works ever since. The fact that he has worked since 15 is an indication of his determination to succeed and of his vitality and active interest in those things in which he believes.

Beginning on a full-time work schedule with the Standard Brass Works in November, 1912, he rapidly forged ahead in the company, being elected president in September, 1925, a short space of 13 years for a large jump.

Mr. Jacobs took an active part in the formation of the Wisconsin Chapter and following his presidency in 1938-1939, he did not relinquish that interest but has continued to serve actively in the chapter work.

HARRY REITINGER

HARRY REITINGER, who has been nominated to serve for three years on the Board of Directors of the American Foundrymen's Association, is resident manager, United States Pipe and Foundry Co., Burlington, N. J. Mr. Reitinger has been active in the work of Association committees and specially in the activities of the Philadelphia Chapter, of which he is a past chairman.

Mr. Reitinger is a native Philadelphian and was educated in schools of that city. He has served as consulting engineer on distilling plant projects and for several years was associated with Emerson Efficiency Engineers, New York. While with this company, he acted as consultant for the government as civil engineer in the installation of distilling plants on various fortifications and during World War I, was retained by the government in the manufacture of munitions, serving both in the United States and Canada.

After the war, he resumed his association with Emerson Efficiency Engineers as associate to Harrington Emerson. He remained with that concern until 1922 when he became associated with the U. S. Pipe and Foundry Company where he rose to his present position.

WM. B. WALLIS

WM. B. WALLIS, nominated as a member of the Board of Directors for a three-year term, is president, Pittsburgh Lectromelt Furnace Corp., Pittsburgh, Pa. Mr. Wallis has been active in the affairs of the Association, serving on a number of its committees and is an acknowledged authority on the use of electric furnaces in the foundry industry.

Born in Pittsburgh, Mr. Wallis was educated in the public schools of that city and later was graduated from Pennsylvania State College in 1911. Following graduation, he became connected with the consulting engineer on the Cheat River Hydroelectric Development for the West Penn Power Co., Pittsburgh, later becoming connected with the Great Shoshone and Twin Falls Water Power Co., Twin Falls, Idaho. For a short time he served as assistant to the vice president in charge of operations, Great Shoshone and Twin Falls Water Power Co., Pittsburgh, and in 1913, became assistant sales manager, West Penn Power Co., Pittsburgh.

In 1915, he resigned and again entered the consulting field with W. E. Moore & Co., Pittsburgh, where he remained for nearly four years. In 1919, he became assistant general manager, Jessop Steel Co., Washington, Pa., from which position he resigned to become associated with his present company where he has remained ever since, rising to the position of president.

DIRECTORS Continuing

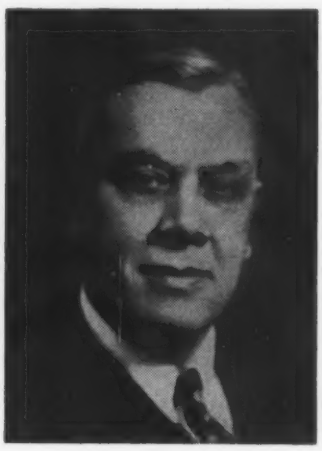
THE members of the Board of Directors of A.F.A. who are shown on this page, will continue to serve on the Board following the Annual Business Meeting and will continue to assist in directing the affairs of the Association. The Foundry Industry owes a debt of gratitude to these busy men who give generously of their time so that their industry may progress.

J. E. Crown,
U. S. Navy Yard,
Washington, D. C.

H. S. Simpson,
National Engineering Co.,
Chicago, Ill.

I. R. Wagner,
Electric Steel Castings Co.,
Indianapolis, Ind.

S. V. Wood,
Minneapolis Electric Steel
Castings Co.,
Minneapolis, Minn.



W. L. Woody,
National Malleable & Steel
Castings Co.,
Sharon, Pa.

R. J. Allen,
Worthington Pump & Machinery
Corp.,
Harrison, N. J.

J. G. Coffman,
Los Angeles Steel Casting Co.,
Los Angeles, Calif.

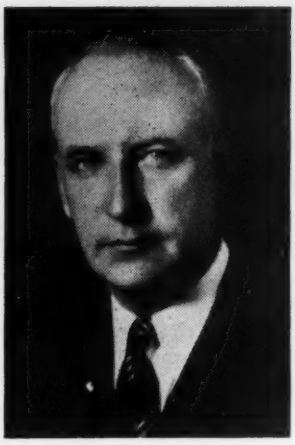
M. J. Gregory,
Caterpillar Tractor Co.,
Peoria, Ill.

Vaughan Reid,
City Pattern Works,
Detroit

L. H. Shannon,
Stockham Pipe Fittings Co.,
Birmingham, Ala.

DIRECTORS Retiring This Year

MEMBERS of the Board of Directors, shown on this page, are retiring from the Board following the 1943 annual meeting. These busy men have given of their time and energy during a 3-year period toward directing the affairs of A.F.A. The Association hopes that their retirement from the Board will not mean an end to their activities in behalf of the Foundry Industry.



G. W. Cannon,
Campbell, Wyant & Cannon Foundry Co.,
Muskegon, Mich.

B. D. Claffey,
General Malleable Corp.,
Waukesha, Wis.

Harold J. Roast,
Canadian Bronze Co., Ltd.,
Montreal, P. Q., Canada

L. P. Robinson,
Werner G. Smith Co.,
Cleveland, Ohio

H. S. Washburn,
Plainville Casting Co.,
Plainville, Conn.

ASA Approves Standard for Manhole Frames and Covers

THE American Standards Association, 29 W. 39th St., New York, recently approved a standard set of specifications covering the design, material and dimensions of manhole frames and covers for subsurface structures, except those used for electric supply and/or gas services. The American Foundrymen's Association was represented on the Sectional Committee which prepared the standard by C. J. P. Hoehn, president, Enterprise Foundry Co., San Francisco, Calif.; E. B. Smith, vice president, American Brake Shoe & Foundry Co., Brake Shoe & Castings Div., New York; and R. E. Moore, vice president and treasurer, Flockhart Foundry Co., Newark, N. J.

This code should be of special interest to foundrymen because it incorporates specifications for gray iron and steel castings for the purposes mentioned. Covered in the specifications are the basis of purchase, general requirements, physical properties and tests, workmanship and finish, marking, and inspection and rejection. Appended to the published standard are diagrams showing various dimensions for both cast iron and cast steel units.

The new American Standard has been designated as A35.1-1941 and may be obtained from the American Standards Association at the above address.

The Whiting Corporation (Canada) Ltd. has moved its offices to 45 Richmond St., West, Toronto. H. M. Rowlette, newly elected vice president and general manager, will be in charge with Alex Ritchie as assistant general manager. Sales offices of the company are maintained in Montreal and Winnipeg.

Bolton and Reichert Lectures

To Feature Program at St. Louis

John W. Bolton

W. G. Reichert

TWO of the outstanding features of the program for the Second War Production Foundry Congress will be the first A.F.A. Foundation Lecture and the first section of a series of lectures on gating and risering. The A.F.A. Foundation Lecture will be presented by John W. Bolton, Director of Research and Testing, The Lunkenheimer Co., Cincinnati, Ohio, internationally recognized foundry metallurgist, while the gating and risering series will be presented by W. G. Reichert, Reichert Engineering Co., Newark, N. J., a man of national renown who has had a wide experience in that field with many metals.

John W. Bolton

The A.F.A. Foundation Lecture has been established by the A.F.A. Board of Awards to provide a medium through which outstanding technicians can discuss important developments and trends within the industry. Mr. Bolton was selected as the first A.F.A. Foundation lecturer because of his long and outstanding work in foundry metallurgy and his recognition as an outstanding authority in that field. He has chosen for his subject, "Foundry Metallurgy and the Castings Industry."

As an indication of the high regard in which he is held, Mr. Bolton was awarded the John A. Penton Gold Medal of A.F.A. in 1937 in recognition of his contributions to the foundry industry in the field of metallurgy and his practical application of research findings to the advancement of the industry. He also has been honored for his work by his Alma Mater with a Master of Science degree in 1921 and the honorary degree of Chemical Engineer in 1935. He also was made a member of Sigma Xi, honorary research fraternity, at the University of Cincinnati, Cincinnati.

Mr. Bolton has been engaged continuously in chemical, metallurgical and research work since he was graduated from Rose Polytechnic Institute, Terre Haute, Ind., in 1918. He began his career as chemist, Proctor & Gamble Co., Kansas City, Mo., and Cincinnati, Ohio. He resigned from this position to become metallurgist, Niles-Bement-Pond Co., Hamilton, Ohio. Later, he was associated with the Frank Foundries Corp., Moline, Ill., and then joined his present company where he rose to his present position.

Mr. Bolton has been very active in the affairs of the American Foundrymen's Association. He has served as a member and chairman of various committees and has written and presented papers on various subjects in the gray iron, non-ferrous and steel castings fields.

William G. Reichert

For many years foundrymen have recognized the need for a compilation dealing with the theory and practice of gating and risering different types of castings from various metals. The Association has been fortunate in securing W. G. Reichert, Reichert Engineering Co., Newark, N. J., to attempt, with the aid of an advisory committee, to gather such data and present it in a series of lectures to the Association. Mr. Reichert is well known to the members of A.F.A. He has spoken on a variety of foundry subjects before nearly every chapter and at numerous conventions of the Association. His experience in castings manufacture embraces the fields of steel, gray iron and non-ferrous metals and hence he is well qualified to undertake this huge piece of work.

(Concluded on Page 54)

CITATIONS FOR SERVICE

To

Rufus F. Harrington

THE JOHN A. PENTON GOLD MEDAL

"For outstanding pioneering work in foundry sand control."

To

Stanley W. Brinson

HONORARY LIFE MEMBERSHIP

"For valuable contributions to the Association and the Industry."

To

Carl F. Joseph

THE WILLIAM H. McFADDEN GOLD MEDAL

"For outstanding metallurgical and shop practice contributions to the Foundry Industry, especially the malleable iron section."

A.F.A. Medalists

1924.... John Howe Hall
Enrique Touceda
1925....*Richard Moldenke
Robert John Anderson
1926.... Thomas Turner, England
John Shaw, England
*E. V. Ronceray, France
1927....*Robert Alexander Bull
1928....*Alexander E. Outerbridge, Jr.
1929....*Jesse Lee Jones
1930.... Dr. Harry A. Schwartz
1931....*Ralph S. MacPherran
1932....*La Verne W. Spring
Dr. Horace W. Gillett
1933.... Dr. Gulliam H. Clamer
1934.... Dr. Arnold Lenz
1935.... Lawrence Lee Anthes
1936.... David McLain
Dr. Heinrich Ries
1937.... John Ward Bolton
Charles Willers Briggs
Dr. James Tucker MacKenzie
1938....*Frederick Ayres Lorenz, Jr.
1939.... Donald James Campbell
Harold Sands Falk
James Ramsay Allan
1940.... Frederick Ketchum Vial
Nathaniel K. B. Patch
Harry Walter Dietert
Frederick A. Melmoth
1941.... Donald James Reese
Max Kuniansky
Frederick Louis Wolf
Charles Edgar Hoyt
1942.... Alfred L. Boegehold
John E. Galvin

*Deceased.

TO THE CASTING INDUSTRY

EACH year, the American Foundrymen's Association honors men of the castings industry who have rendered outstanding service to that industry. This is fitting because the A.F.A. is the only technical organization of the foundry industry embracing all its branches.

Unlike the fighting men of our armed forces, the men honored have not rendered outstanding service in a moment of battle. These men are honored because of service over a period of years and because, through their achievement, they have advanced their respective branches of the castings industry or the industry generally. However, like our soldiers, they have performed service to their industry beyond the call of daily duty and have made contributions which have helped the industry to progress.

This year, the Board of Awards of A.F.A., which is composed of the last seven living past presidents of the Association, has chosen three men to be honored: Rufus F. Harrington, Hunt-Spiller Mfg. Co., Boston, Mass.; Carl F. Joseph, Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich., and Stanley W. Brinson, Norfolk Navy Yard, Portsmouth, Va.

★ ★ ★

RUFUS F. HARRINGTON

RUFUS F. HARRINGTON is foundry superintendent, Hunt-Spiller Mfg. Co., Boston, Mass., and has contributed much to the advancement of the industry both nationally and locally. His participation in the work of A.F.A. and other associations and societies indicates his willingness to give as well as take information. While it would be difficult to cite all his contributions to the foundry industry, he will be honored by being awarded the John A. Penton Gold Medal of A.F.A., his citation reading "For outstanding pioneering work in foundry sand control."

Mr. Harrington entered the foundry industry in 1913 when he became associated with his present company. It is interesting to note that he has attended every convention of A.F.A. since that date, indicating his interest in the industry and the activities of the Association.

Being first employed as chemist, it was somewhat natural that he should become interested in sand control and conservation, a subject which was just beginning to develop. As an indication of this interest, he was appointed a member of the original joint committee of the National Research Council and the American Foundrymen's Association which in 1921 inaugurated the sand research program which has been carried on by the Association ever since and has resulted in hundreds of thousands of dollars savings to the industry. He also has served on many other committees and subcommittees of the Foundry Sand Research Committee and has been a member of its executive committee.

Mr. Harrington's interest in sand research and other activities of the Association and the numerous papers on a variety of subjects which he presented at its meetings led to his nomination and election as a director of A.F.A. in 1933 for a 3-year period.

Born in Chicago, Mr. Harrington entered Tufts College, Boston, and was graduated in 1913 with a bachelor of science degree. Immediately following completion of his college course, he became associated with the Hunt-Spiller Mfg. Co., Boston, where he has remained for 30 years. Beginning as chemist, he has served successively as chemist in charge of laboratories, metallurgist in charge of metallurgical operations, testing of materials, and sand research and conservation until 1938. In that year, Mr. Harrington was made foundry superintendent and chief metallurgist, but relinquished the latter duties with the inauguration of a steel foundry division of the company when he was placed in charge of both the iron and steel foundries.

Mr. Harrington's activities have not been confined to A.F.A. He has written extensively for the technical press and is a member of the American Society for Testing Materials, American Institute of Mining and Metallurgical Engineers, American Society for Metals, Army Ordnance Association and War Products Advisory Committee. He is a past president of the New England Foundrymen's Association and a past chairman of the Boston Chapter, American Society for Metals.

CARL F. JOSEPH

THE second man who will be honored for his contributions to the foundry industry is Carl F. Joseph, research metallurgist, Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich., whose citation for award of the William H. McFadden Gold Medal of A.F.A. reads, "For his outstanding metallurgical and shop practice contributions to the foundry industry, especially the malleable iron section."

Mr. Joseph has been connected directly with the foundry industry for 21 years and for 13 years has been a member of the American Foundrymen's Association. He has taken and is taking an active part in Association work, serving on many committees of the Malleable Division. At present, he is a member of the Advisory Committee and chairman of the Program and Papers Committee of that Division. He has presented many papers before A.F.A. on a variety of subjects of interest to malleable iron foundrymen and is especially well known for his contributions in connection with the development of pearlitic malleable irons. He also has written two exchange papers for A.F.A. which were presented before European foundry groups, the first at the International Foundry Congress at Milan, Italy, in 1931, and the second, in 1942, to the Institute of British Foundrymen.

Mr. Joseph is a native Buckeye, being born in Cincinnati, Ohio, but later moved to Saginaw, Mich., where he was graduated from the local high school. He then entered the University of Michigan, Ann Arbor, from which he was graduated in 1917 with a B.S. degree in chemical engineering. He returned to his home town and entered the employ of the Saginaw Malleable Iron Company and received his introduction to the manufacture of castings. He remained one year and then joined the Bureau of Aircraft Production, Pittsburgh, and later served at McCook Field, Dayton, Ohio, as research metallurgist.

In 1919, he accepted a position with the General Motors Research Laboratories, Detroit, where he remained 3 years and then was made chief metallurgist, Olds Motor Works, Lansing, Mich. He served in this capacity for only a short time before being transferred to his first love, the Saginaw Malleable Iron Division of General Motors, where he has served as chief metallurgist since 1922. In addition to his interest in A.F.A., Mr. Joseph is an active member of the American Society for Metals and the A.S.T.M.

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STANLEY W. BRINSON

IT IS quite fitting in these times that the third man to be honored by A.F.A. should be connected with the U. S. Navy which is doing such a fine job of defending us all on the oceans and seas throughout the world. He is Stanley W. Brinson, master molder, Norfolk Navy Yard, Portsmouth, Va., and his citation, on the basis of which Honorary Life Membership in A.F.A. will be conferred, reads, "For his valuable contributions to the Association and the foundry industry."

Mr. Brinson has been interested in the work of the Association for many years. In the past, he has either authored or co-authored several papers on steel foundry practice, which have provided basic information to the steel castings industry. Mr. Brinson's papers are noted as monumental pieces of work, data for which in many instances has been accumulated over a period of several years.

It is interesting to note that Mr. Brinson's first love was the Navy. He began his career at the Norfolk Navy Yard in 1906 as an electrical helper. He resigned in 1909, however, to enter Virginia Polytechnic Institute from which he was graduated in 1913 in electrical engineering.

Upon graduation, he returned to the Norfolk Navy Yard where he taught mathematics in the apprentice school for a short time but soon was transferred to the foundry to establish a laboratory. In 1916, he was appointed assistant to the shop superintendent and placed in charge of the manufacture of gas engines and the foundry, being responsible for accounting, testing and manufacturing production. In 1930, Mr. Brinson was appointed master molder, which is the equivalent to foundry superintendent in industry, having charge of the foundry, a position he has held ever since.

★ ★ ★

Wis. U. Offers Courses In Foundry Practice

THE University of Wisconsin in Milwaukee, Milwaukee, operated by the Extension Division of the University of Wisconsin, is offering several foundry subjects at its tuition-free evening courses under the auspices of the United States Office of Education. These courses are now in their second semester.

The first semester course covered basic fundamentals of metallurgy, such as constitutional diagrams. During the present semester, three advanced courses are being offered. These are: General Gray Iron Foundry Metallurgy conducted by W. B. Hambley, Allis-Chalmers Mfg. Co.; General Steel Foundry Metallurgy conducted by Sylvester Mueller, Falk Corp.; and Nonferrous Metals and Alloys conducted by John Klement, Ampco Metal, Inc., all of Milwaukee.

A.F.A. Past President Frank Lanahan Dies

FRANK J. LANAHAN, president, Fort Pitt Malleable Co., Pittsburgh, Pa., and past president of the American Foundrymen's Association, died at his home on March 2 after an illness of about two years. Up until his illness, Mr. Lanahan took an active part in the business and civic activities of Pittsburgh and the work of the Malleable Founders' Society and the American Foundrymen's Association.

He was a native of Pittsburgh and lived and was educated there. He attended Grant Public School, Pittsburgh High School and St. Mary's Academy, Blairsville, Pa.

In addition to serving as president, Fort Pitt Malleable Iron Co., he also had served as president, Davis Brake Beam Co., Johnstown, Pa.; chairman of the Board, Auto-Tite Joints Co., Pittsburgh; president, Fort Pitt Mine Equipment Co., Jeannette, Pa.; president, Bank of McKees Rocks and vice president, Chartiers Trust Co., McKees Rocks, Pa.; director, Pittsburgh Screw & Bolt Co., Pittsburgh; Montour Railroad Co., Pittsburgh; Warren Foundry & Pipe Corp., Phillipsburg, N. J.; vice president, Pennsylvania State Chamber of Commerce, Harrisburg, Pa.; National Councillor to United States Chamber of Commerce, Washington, D. C.; member, Board of Trustees, Carnegie Institute, Carnegie Institute of Technology and Carnegie Library, Pittsburgh; director, Railway Business Association, New York; director, Western Pennsylvania Safety Council, Pittsburgh; chairman of the executive committee and director, Railway Club of Pittsburgh; director, Allegheny County Council Boy Scouts of America, Pittsburgh; director, Pennsylvania Forestry Association, Philadelphia; director St. Joseph's Protectory for Homeless Boys, Pittsburgh; director, De Paul Institute for Deaf Mutes, Pittsburgh; Corporator, St. Paul's Orphan Asylum, Idlewild, Pa.; member, Board of Managers, St. Mary's Cemetery, and director, National Conference of Catholic Charities, Pittsburgh.

Frank J. Lanahan

Mr. Lanahan also was a member of the American Iron & Steel Institute, Western Pennsylvania Engineers Society, American Society of Safety Engineers, and American Society of Municipal Engineers.

During World War I he was active in Red Cross and other war work. Mr. Lanahan was widely known throughout the foundry industry where he had many friends who will miss his genial and lovable personality.

ASA Approves Safety Code for Cranes

THE American Standards Association, 29 W. 39th St., New York, has approved the proposed American Standard Safety Code for Cranes, Derricks, and Hoists which has been sponsored by the Bureau of Yards and Docks, U. S. Navy Department, and the American Society of Mechanical Engineers. The American Foundrymen's Association was represented on the Sectional Committee, which drafted the code, by A. H. McDougall, Whiting Corp., Harvey, Ill.

The code applies to the construction, installation, inspection, maintenance, and operation of cranes and derricks, driven by steam engines, electric motors or internal combustion engines; to their runways; to simple drum hoists of whatever motive power; to overhead electric hoists and their runways; to overhead air hoists; and to hand-powered derricks.

The code does not apply to any hoisting machine having maximum capacity of not more than one ton or to railway or automobile wrecking cranes, skip hoists, hand-operated chain hoists, hoist-like units used for horizontal pulling only, mine hoists, conveyors, shovels and drag-line excavators, nor to locomotive or crawler cranes having a lifting capacity exceeding 120,000 lb. at 12-ft. radius or equivalent moment. This code does not apply to temporary use of cranes, derricks, and hoists on construction work. The proposed code is to provide reasonable safety for life, limb and property, and the requirements are the minimum compatible with that purpose.

The code defines various types of cranes, hoists and derricks, showing line illustrations of the various types. It also covers general rules for construction and installation of cranes, as well as rules applying specifically to various types. Part 2 covers inspection, testing and maintenance and Part 3, operation

Copies of the code may be obtained from the American Standards Association at the above address. The code has been given the ASA designation B30.2-1943.

Belle City Malleable Loses Two Officers

THE Belle City Malleable Iron Co., and the Racine Steel Castings Co., Racine, Wis., suffered the loss of two of their executives, Judson M. Stone, vice president, who died on February 23, and Stanley Kitto, treasurer, who died on January 30.

Division and Committee HEADS REPORT

THE American Foundrymen's Association is recognized as the technical and educational organization of the foundry industry. As such, it maintains some 80 committees and subcommittees, with approximately 400 members, engaged in various activities of interest to the castings industry. The interests which have a national character are divided into seven groups as follows: Gray Iron Division, Steel Division, Malleable Iron Division, Brass and Bronze Division, Pattern-making Division, Aluminum and Magnesium Division, and General Interest Committees. The work of these committees, plus the papers presented at annual meetings of the Association, are recorded in the publications of the Association which are broadcast to its membership. The contents of these publications cover the practical and theoretical aspects of practically all phases of foundry production, operation and control.

In addition, A.F.A. maintains 24 local chapters in the foundry centers of the country. These chapters serve as a medium for the further dissemination of foundry information and as a force to bring the foundry industry to the attention of industry and the public in the respective areas in which they serve. They also form the basis of fellowship within the industry and promote a broader appreciation of the industry's problems. The national, plus the chapter activities of the Association, tend to weld its members into a strong national force for wider appreciation of the foundry industry as a basic one and for increased utilization of cast products.

The messages from chairmen of the various Divisions and General Interest Committees of the Association given below explain how these divisions and committees are functioning to build the castings industry.

Steel Division Promotes Steel Castings Usefulness

By C. E. Sims,* Chairman, Steel Division.

WHEN the activities of the Steel Division are mentioned, it should be borne in mind that reference is being made to each member of the A.F.A. interested in steel castings. It is not the work of a few individuals, committees, chairmen, or officers. They are chosen merely to plan or coordinate the activities. Rather it is the work of a group of men associated by a common interest and by a desire for mutual profit from a free interchange of ideas and practices.

Experience has shown that this desire to give freely of one's knowledge need not be entirely philanthropic, for receipts in this commodity are usually greater than the outlay. All too often an uncommunicative concern has awakened too late to learn that their jealously guarded secret is an outmoded practice in many other plants and that information on improved practices could be had for the asking. Many foundrymen have come to the realization that the success of any individual foundry cannot go much beyond the success of the average. The individual, therefore, has an opportunity to benefit in proportion to the progress made by the whole industry.

The accomplishments and activities of the Steel Division have centered around the main and practically sole objectives of gathering and disseminating knowledge useful in promoting the engineering usefulness of steel castings. The success in attaining these objectives has resulted from the most gratifying willingness of the many members to contribute their bit.

Of the various committees appointed to carry out special assignments, the Committee on Program and Papers probably has the most arduous task. It is their duty to read and criticize technical papers that are submitted, to accept or reject such papers on the basis of technical reliability and pertinent value, to see that accepted papers are in the proper form for presentation, and to arrange programs for the annual convention.

Committees Gather Data

Each year a round table conference is held at which discussion is "off the record" but at which any question may be asked and some kind of answer received. In order to guide the discussion into channels of the greatest interest to the majority, the Committee on Round Table Conference gives careful thought during the year to such subjects and endeavors to have present at the conference men with special knowledge to discuss them.

Other committees such as those on Methods of Producing Steel, on Heat Treatment, on Radiography, and on Magnetic Powder Testing, gather information on these special subjects and report from time to time to the whole division. When a committee's work is done it may be disbanded, but new committees may be appointed at any time a

*Supervising Metallurgist, Battelle Memorial Institute, Columbus, Ohio.

subject seems to require such special attention.

During the past 15 to 20 years, the steel foundry industry has made a remarkable advance in technology and in the integrity and reliability of steel castings. But as a parent, because of proximity, is often unaware of the rapid growth of his progeny, so it is probable that many foundrymen are unaware of the real strides taken by his profession. The Steel Division of the A.F.A. has just cause for pride on having taken an active part in that progress.

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Brass and Bronze Division Is New, Yet Old

By Wm. Romanoff* Chairman, Brass and Bronze Division

UP UNTIL last year, the non-ferrous interests in the American Foundrymen's Association were served by its Non-Ferrous Division. Recognizing the increased interest in the casting of aluminum and magnesium, A.F.A. divided the Non-Ferrous Division into two units, known respectively as the Brass and Bronze Division and the Aluminum and Magnesium Division. Thus, the present Brass and Bronze Division has the distinction of being one of the oldest, yet one of the youngest, among the divisions of A.F.A.

When the divisional setup of Association interests was made in 1929, the Non-Ferrous Division realized that physical properties of any alloy are meaningless unless the foundryman can make good castings from it. The Non-Ferrous Division decided to assist the foundrymen in their task. As a result, one of the first committees formed was the Committee on Recommended Practices whose duty it was to prepare and publish general instructions on the proper techniques of casting the various groups of non-ferrous alloys.

Production Practices Recorded

The activities of the Recommended Practices Committee cover a period of over 10 years, during which time practices have been produced for nearly every type of copper-base alloy cast, as well as aluminum and magnesium. The practices for the latter two groups of alloys have been taken over by the Aluminum and Magnesium Division of the Association.

More recently, the best practices used by most of the specialized foundries in the country in casting parts for implements of war were accumulated by the Recommended Practices Committee and in addition to being published and discussed at the Associating meetings, will presently be published in book form by the A.F.A. This will include the manganese bronzes, aluminum bronzes, silicon bronzes, high tin bronzes, red brasses, high lead brasses and practically all the other alloys now being used in war production.

The Brass and Bronze Division likewise has interested itself in research and on several occasions, through the National organization, has sponsored research fellows at the Bureau of Standards to study specific problems relating primarily to the copper-base alloy field. It also has for several years maintained a Research Committee which has published interesting information on the effect of gases on copper alloys and elements on their physical properties.

One of the outstanding pieces of work done by a committee of the division is that conducted by its Committee on Analysis of Defects in Non-Ferrous Castings. The work of this committee was completed in 1936, and as a tribute to its thoroughness, until the present time, no further additions have been made to its report, although they have been widely solicited.

As most foundries are making castings that are entirely foreign to their peace time production, the A.F.A. is exerting every effort to assist them at a time when they need help most in their efforts to bring this war to a speedy and successful conclusion.

*Vice Pres., H. Kramer & Co., Chicago.

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Pattern Interest Rises With Division Formation

By Vaughan Reid,* Chairman, Patternmaking Division.

THE Patternmaking Division is one of the newer divisions of the American Foundrymen's Association, but one of the oldest branches of the castings industry for no casting has ever been made without a pattern of some kind. Foundrymen, in general, did not realize fully the importance of patterns in the foundry until relatively recently. With the introduction of mass production of castings, brought about largely by the demands of the automotive industry, the necessity for better and more accurate patterns became obvious but the problems of the pattern-

*President, City Pattern Works, Detroit, Mich.

maker multiplied by many times.

For many years, at conventions of A.F.A., there were many wonderful papers read on cast iron, steel, malleable iron and non-ferrous alloys. It seemed that no one ever thought of having a discussion or paper pertaining to the different ramification of the pattern industry. In 1940, realizing that a foundry could not operate successfully without well-made patterns and that the interests of the patternmaking industry were closely interwoven with those of the foundry, the American Foundrymen's Association formed the Patternmaking Division.

Pattern Improvement Evident

With the formation of this division, interest in patterns spread to the chapters and now we have meetings both at the chapters and at the annual meetings of the Association. The papers and discussions presented at these meetings have caused both the foundryman and the patternmaker to do a lot of extra studying. Through those papers and discussions, the patternmaker has found better methods for making patterns as well as better materials. Many patternmakers also have become interested in metallurgy so that they can choose the right metal for an application; one which will resist abrasion and which will hold its shape after it has been accurately machined.

We patternmakers have had very interesting and instructive discussions at our A.F.A. conventions and the sessions seem to be better attended as the years go by. This is because foundrymen, as well as patternmakers, are realizing more and more every day the importance of well-built, strong, and accurately-machined patterns from which to make their production castings. They also know the meaning of the adage, "A casting is no better than the pattern from which it is made," and that, when duplicate patterns are made, it is absolutely necessary to have every one exactly alike.

These are just some of the lessons that have been taught the patternmaker by the meetings of the American Foundrymen's Association and its Chapters.

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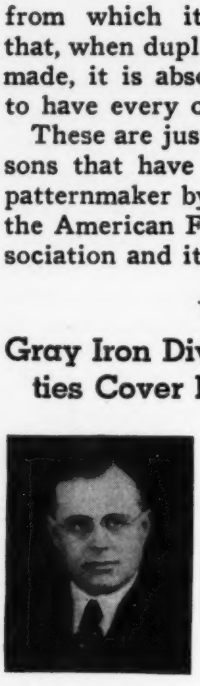
Gray Iron Division Activities Cover Many Subjects



By F. J. Walls,* Chairman, Gray Iron Division.

FOR many years, the Gray Iron Division of A.F.A. has taken an interest in the many technical problems which have faced the gray iron foundry industry periodically. The subjects covered have been of wide general interest to the foundryman, and every effort has been made to keep him up-to-date with the new developments in cast iron. Papers have been presented on a large variety of subjects at past conventions, many dealing with the metallurgical improvements in gray iron and many with the practical phases of production.

With the advent of the war, the interest of the Gray Iron Division naturally swung toward those problems which that branch of the industry might assist in solving, as well as carrying to completion certain projects deemed to be of great value to the industry. One of the projects which the division is sponsoring and which it is sure will prove of great value to the gray iron foundry industry is the cupola research project.

At present, the committee for the project is engaged in compiling a handbook on cupola operation which will be an outstanding contribution to melters of cast iron. The compilation of the handbook has pointed out many deficiencies in our knowledge of melting this material, and it is expected that once the handbook is completed, research will be begun not only among foundries but also in institutions with proper research facilities, which will fill in the gaps.

High Temperature Uses

Last year, through the American Society for Testing Materials, it was suggested that some organization undertake a study of the application of cast iron at high temperatures. Always ready to be of service, the Gray Iron Division organized a committee to study the high temperature properties and applications of cast iron. This committee now is acting as an Advisory Committee to the War Metallurgy Committee who have become interested in the project and have sponsored a survey of not only the existing information on the characteristics of cast iron at elevated temperatures but also the application of that material in ranges above 450° F.

The results of this survey will be presented in preliminary form to gray iron foundrymen attending the St. Louis annual meeting, under the auspices of the War Metallurgy Committee. The presentation of the survey information will be part of a symposium on cast iron as an engineering material. Included also in this symposium will be a discussion of the work of the Gray Iron Division Committee on Classification of Graphite in Gray Iron.

This committee of A.F.A. cooperates with Subcommittee 7, A.S.T.M. Committee A-3, which deals with the microstructure of cast iron. These committees have jointly published a recommended practices for the evaluation of graphite in gray cast iron and

*Metallurgist, International Nickel Co., Detroit, Mich.

are still cooperating in a further effort to refine the present tentative practice.

Since their inception several years ago, the Shop Operation courses, which are "off-the-record" educational sessions and which give the foundryman an opportunity to discuss his practical problems, have been a popular feature of the Gray Iron Division programs. These sessions afford practical foundrymen an opportunity to discuss various problems which arise in the shop and to find solutions for them. Some of the outstanding men of the gray iron industry take part in these discussions, thus offering some of the best opinions in the industry for the assistance of the gray iron foundrymen.

While these committees probably are of considerable importance, because of their immediate effect on war work in research, other committees of the division are functioning in equally important tasks. The Committee on the Analysis of Casting Defects, which meets regularly and which has published much of its findings in publications of the Association, is doing an excellent piece of work which should result in a better understanding of the causes of defective castings. The welding of cast iron also is an important subject which is being studied by a committee, and the Committee on Pig Iron Qualities still is struggling with the problem of "off iron."

All in all, the Gray Iron Division of the Association is continuing to render to foundrymen manufacturing castings from that material the important service that it has rendered in the past and will continue to render in the future.

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Malleable Division Stresses Symposia

THE Malleable Iron Division under the chairmanship of A. M. Fulton, Northern Malleable Iron Co., St. Paul, Minn., is this year continuing the practice of the past few years in arranging symposia covering the most important phases of malleable production. This year at St. Louis, melting methods will be stressed, with some 10 papers discussing the various types of melting practice. Last year Graphitization of White Cast Iron was the subject. The Program Committee of the Division, under the chairmanship of Carl F. Joseph, Saginaw Malleable Iron Division, General Motors Corporation, Saginaw, Mich., has the arranging of the Symposia.

The Division over the years has published a large number of papers on the various technical and shop practice phases of malleable production, has cooperated with Cast Metals Handbook Committee by furnishing material for the Malleable section, and worked with the A.F.A. Cost Committee in stimulating interest in uniform cost practices. It has also worked closely with the Malleable Founders' Society in developing specifications of the A.S.T.M.

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Aluminum and Magnesium Division Begins Its Work

By Dr. N. E. Woldman,* Chairman, Aluminum and Magnesium Division.

IN 1942, the American Foundrymen's Association, realizing the growth of aluminum and magnesium casting production, contacted various manufacturers of such castings asking if it could be of service to them. The unanimous thought on the part of those contacted was that the Association could further the interchange of information among them. As a result, it was proposed that an Aluminum and Magnesium Division of the Association be formed and that these interests be divorced from the then Non-Ferrous Division.

Accordingly, an Advisory Committee was set up to organize the division, and on January 29, 1943, held its first meeting. The meeting was well attended and the enthusiasm evidenced presages that this new division of A.F.A. will render valuable service to the manufacturers of aluminum and magnesium castings.

At the above mentioned meeting, various committees on subjects of interest were formed and a program was formulated for the Second War Production Foundry Congress. The first participation of the new division in the annual program will consist of three sessions, one a round-table meeting, and the influence of the division on other various portions of the program is already evident.

Among the subjects to be discussed are recommended practices for the production of castings from the various magnesium and aluminum alloys, chemical methods for controlling inhibitors in magnesium foundry sands, thermal gradients in cores for magnesium alloys, and fluoroscopic examination of light alloy castings.

With this excellent beginning, the Aluminum and Magnesium Division of the American Foundrymen's Association makes its bow and hopes to be of service to manufacturers of castings from these alloys.

*Chief Metallurgical Engineer, Eclipse Aviation-Pioneer Instrument Division of Bendix Aviation Corp., Bendix, N. J.

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Cost Committee Fosters Use of Standard Cost Systems

By R. L. Lee,* Chairman Cost Committee.

THE A.F.A. Cost Committee was one of the first committees established by the Association. Organized in 1907, the committee has done much in a general way to encourage the use of

*Comptroller, Grede Foundries, Inc., Milwaukee, Wis.

standardized cost systems in foundries throughout the country. In the first years of its existence, the committee discussed the use of cost systems in existence at that time, but in 1915, because of its experience and realizing that some steps were necessary to establish a comprehensive and satisfactory cost system for foundries, it employed an expert who prepared a standard cost system. At first the cost system was installed and serviced by the expert but later was given to the general membership of A.F.A.

Compares Cost Factors

The system was not perfect, especially for smaller foundries and the Cost Committee continued its efforts to throw more light on systems which were better adapted for such foundries. This policy of the committee continued for several years but finally it decided that its policy would be to do all that was possible to foster the use of cost systems developed by the various branches of the industry. More recently, the committee has been engaged in the study and development of a comparison of cost factors in the various departments of the industry's various branches and correlating them. This classification was completed in 1941 and presented to the industry at that time.

Another study by the Cost Committee resulted in the approving and publication of "Recommendations to Buyers of Castings." These recommendations were later approved by the National Association of Purchasing Agents.

The committee is continuing to further the development of cost methods in various branches of the industry and to discuss questions of current interest at its various meetings. With the outbreak of the present war and the entrance of foundries into war production, the matter of determining costs under government contracts has become of paramount interest. Realizing this, the committee is planning to have as its main topic of discussion at the St. Louis annual meeting, an explanation of the principles for determining costs under government contracts as it affects the foundry industry. Other matters of current interest will also be discussed.

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A.F.A. Aids in Establishing Product Specifications

By H. Bornstein,* Past AFA-ASTM Representative.

SHORTLY after the organization of the American Foundrymen's Association in 1896, a move was begun to form an organization for the purpose of formulating specifications for various industrial products. The activities of the American Foundrymen's Association, through its Committee on Standardized Drillings for Chemical Analysis of Cast Iron, and similar committees played an important part in giving impetus to this move. The interest in specifications finally resulted in the formation of the American Society for Testing Materials in 1900, A.F.A. becoming a charter member of that organization. Some of A.F.A.'s most active members participated in the organization of A.S.T.M., for example, Dr. Richard Moldenke, Thomas D. West, and W. J. Keep.

As a result, A.F.A. has been interested in the activities of A.S.T.M. since the latter's inception. A.F.A. cooperation with A.S.T.M. at first depended on the interest of individual members. In 1922, a joint committee of A.F.A. and A.S.T.M. worked out an agreement for official cooperation between the two organizations. Members of the joint committee representing A.F.A. were the then President W. R. Bean, R. A. Bull, and A. H. Jameson. A.S.T.M. representatives were: G. K. Burgess, G. H. Clamer, and C. L. Warwick.

Committee Representation

The agreement provided for official representation of A.F.A. on various A.S.T.M. committees whose activities were of interest to the foundry industry, and at that time were as follows: A-1 on Steel, A-3 on Cast Iron, A-4 on Heat Treatment of Iron and Steel, A-7 on Malleable Iron, B-2 on Non-Ferrous Metals and Alloys, C-8 on Refractories, D-6 on Coke, and E-4 on Metallography. Since then, A.S.T.M. has appointed official representatives on Committee B-5 on Copper Base Alloys, E-1 on Methods of Testing, E-7 on Radiography, B-7 on Light Metals and Alloys, various subcommittees of the previously mentioned committees, and, in addition a Joint Committee on Heat Treatment and the American Coordinating Committee on Corrosion, both of which were organized and supervised by A.S.T.M.

More recently, with the organization of the Aluminum and Magnesium Division, representation is being sought for representatives of this division on the above committees in which they are interested.

Since the foundry industry requires many product and material specifications, as well as to the foundry industry, both in standard testing specifications as guides for successful operation, the A.S.T.M.-A.F.A. cooperation in these activities is a logical one and has played a part in the formulation and development of

*Director, Testing and Research Laboratories, Deere & Co., Moline, Ill.

such tests and specifications to fit the needs of the foundry industry.

The A.S.T.M. has for its goal the promotion of a knowledge of engineering and the standardization of specifications and methods of testing, while the fundamental work of A.F.A. lies in the improvement and development of the casting industry along the lines of technical control, manufacturing methods, equipment and shop processes. The work of A.S.T.M. and A.F.A. goes hand in hand because tests and specifications must follow the development of product. In some cases, proper specifications stimulate development of product. The cooperation between A.F.A. and A.S.T.M. also serves another purpose, namely, keeping the improvements in product and processes before a large group of consumers and general interests which are represented on A.S.T.M. committees along with A.F.A.

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Sand Research Improves Quality of Castings

By Dr. H. Ries,* Technical Director, Foundry Sand Research Committee.

IT IS now 22 years since the American Foundrymen's Association initiated the study of the properties of foundry sands and established a committee on sand research. When this committee was appointed, the opinion among many foundrymen was that sand research was a fine plaything for the scientists. However, the development of this foundry sand research program and the enormous savings in reduced casting losses and in conservation of sand, has definitely showed that the scientific investigation of foundry problems returns to the industry many times its investment.

When it was organized, the original committee decided that moisture content, permeability, strength, fineness, refractoriness, and durability or life were of paramount interest. Therefore, their first studies were of these properties, and tests were developed for some of them. As the program of the committee developed, numerous other problems came before it and it was found necessary to appoint a number of subcommittees to consider the different problems separately and to evaluate the significance of various properties and their importance. Some of the problems investigated include flowability, toughness, deflection, and mold hardness.

High Temperature Studies

These properties can be determined at room temperature. However, more recently, the properties of foundry sands at elevated temperatures have come into the spotlight and their relative importance will overshadow those determined at room temperature.

In the beginning, it was realized that the properties of sand must affect the behavior of metal in the mold and, therefore, the first problem of the committee was to develop standard methods for determining them, and this has been and remains one of the important duties of the Foundry Sand Research Committee. The tests thus far standardized have been published by the committee in the book "Standards and Tentative Standards for Testing and Grading Foundry Sands and Clays." This book does not include the determination of high temperature properties.

The development of testing sand at high temperatures, as it progressed at Cornell University, Ithaca, N. Y. under the direction of a special subcommittee on Physical Properties of Steel Foundry Sands at Elevated Temperatures introduced so many new problems and the possibilities became so large that additional assistance was sought. The Naval Research Laboratory, Washington, D. C., indicated an interest in this work and an agreement now has been worked out whereby this laboratory will cooperate in the high temperature testing program. This should speed the flow of information on this important subject to foundrymen throughout the country.

With the development of increased use of aluminum and magnesium for casting purposes, it became recognized that the same methods of testing might not apply with equal satisfaction to sands into which the various type metals are cast. As a result, there has been a tendency to investigate given fields where special problems in sand testing arise.

Recently, a Subcommittee on Light Alloys has ben formed to determine what changes, if any, may be necessary to adjust the various methods of testing to the light metals casting industry. A subcommittee also has been formed to study the application of present standard tests to cores. Other committees also deal with such problems as grading and fineness, flowability, durability, effect of sands on properties of castings, and others.

Problems to Be Solved

It would seem that after 22 years we should have found out nearly everything we need to know about foundry sands. But, this is not the case. Some of the problems yet to be solved include the cause of flowability with a satisfactory method for testing that property, a quick and accurate test to determine durability, the effect of room and elevated temperatures of different types of bond clay, and the effect of constituents of the sand on its expansion and contraction at elevated temperatures. Even the mineral composition of common sand, neglected in the past, is being found to be of importance.

The solution of all these problems can result only in the development of better sand mixtures which, in turn, will mean fewer casting losses and further increase in the savings returned to industry through the activities of the Foundry Sand Research Committee.

*Ithaca, N. Y.

REPORTS TO THE INDUSTRY

By Division and Committee Heads

Safety and Protection in Foundries Spotlighted

By Jas. R Allan,* Chairman, Industrial Hygiene Codes Committee.

IN THE early 1930's the foundry industry became confronted with numerous lawsuits brought by employees alleging disability through silicosis, pneumoconiosis, and other occupational diseases. The foundry industry was only one of a number of industries given a great deal of unfavorable publicity with respect to working conditions within its plants. Our industry as a whole faced a difficult situation because it was alleged that the dusts created in the foundry operations were the source of pulmonary diseases.

Problem Nation-wide

Because the problem confronting the industry became nation-wide, the safety and hygiene section of the American Foundrymen's Association was formed, of which the Industrial Hygiene Codes Committee became a part. The Safety and Hygiene Section aided in the inspection of foundries, gave expert testimony in connection with occupational disease lawsuits, counselled with various insurance rating boards and state law enforcement agencies, and did a tremendous amount of work to bring about a clear conception of the whole silicosis picture.

The Industrial Hygiene Codes Committee worked in close cooperation with many agencies of the states and national governments in an effort to formulate reasonable recommended practices and state code requirements with regard to the control of occupational diseases as found in industry. The Industrial Hygiene Codes Committee took it upon itself to draft recommended good practice codes that would apply to the foundry and allied industries and which could be used by employers as a guide in the control of accidents and occupational disease exposures. Since these codes have been completed and turned over to industry, quite a number of state enforcement agencies have seen fit to adopt them in their entirety or include portions of them in their codes for control of exposures.

Codes Developed

This committee to date has developed six codes:

Testing and Measuring Air Flow in Exhaust Systems.

Grinding, Polishing and Buffing Equipment Sanitation.

Handbook on Fundamentals of Design, Construction, Operation and Maintenance of Exhaust Systems.

Metal Cleaning Sanitation.

Good Safety Practices for the Protection of Workers in Foundries.

Recommended Practices for the Protection of Life, Property and Production in the Foundry Industry During the War.

(This last mentioned code was developed at the request of the Office of Civilian Defense, Washington, D. C., for the protection of plants against sabotage and other factors arising out of the present war.)

All of these activities of the Safety and Hygiene Section and the Industrial Hygiene Codes Committee have had an effect on safety and occupational disease laws and code requirements in that they have been instrumental in lowering the compensation rates, particularly for occupational disease hazards, in the foundry and other industries.

The committee has additional codes of good practice recommendations that will be brought out as rapidly as time will permit. Especially is the committee interested in developing some codes of safe practices for the non-ferrous branch of the industry, particularly pertaining to magnesium and other metals on which there is some question regarding the hazards involved.

The program being sponsored by the Safety and Hygiene Section at the 1943 St. Louis Annual Meeting is being drafted with a view of securing preliminary information on the hazards of the magnesium and aluminum foundries, and the problem of fume, smoke and dust abatement in non-ferrous foundries.

*Asst. Manager, Industrial Engineering and Construction Div., International Harvester Co., Chicago.

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Foreman Training Is Important War Activity

By W. G. Conner, Jr., Chairman, Foreman Training Committee.

THE American Foundrymen's Association covers all phases of the foundry — metals, materials and men. The vast majority of the activities, committees, and sessions at the annual meetings deal with the apparent more important metals and materials. The Association realizes the importance of related subjects and their necessity to the production of high quality castings and has established groups for the furtherance of this work. The Foreman Training Committee is one of these groups working on a definite assignment.

Foreman Training is a broad subject, and many agencies such as Federal, State, copyrighted course, schools, and colleges are in existence for the sole purpose of training foremen. Neither the Foreman Training Committee

*Superintendent of Foundries, Walworth Co., Washington Park Works, Washington Park, St. Clair County, Ill.

nor the Association has a desire to enter into competition with any such operations. However, the success of finishing touches of any training program rests with the individual foundry or company, because in the final analysis, it must be made to fit in one's own shop. It is with these thoughts in mind that the Foreman Training Committee functions to be of service to you as members of the Association and offers two distinct services.

Committee Offers Services

First: Members of the Association are at liberty to write or call upon the Committee at any time for assistance or advice. We do not claim to know all of the answers, but we will endeavor to seek a solution for a particular problem and forward the results of our findings. Also, the members of the Committee may be called upon to address any local chapters of the Association or to act as leaders in a round table discussion on the subject.

Second: There is one session on Foreman Training at the annual convention, three types of meetings have been used. One is to obtain a noted speaker or author to present an address followed by a discussion period. Another is to have one or more papers on successful plans presented by members or others followed by a discussion. The third and apparently most popular is an open meeting with a round table or panel discussion on all angles of Foreman Training. There is no recording made of such a meeting which results in everyone talking without fear of being quoted. The last mentioned method is the one that will be used at the War Production Foundry Congress at St. Louis in April.

In addition to the panel discussion, which will be staged at the session on foreman training, the Job Relations Training Section of the Training Within Industry Division, War Manpower Commission, will give a demonstration on the application of its methods to the training of foremen. This demonstration should be of great interest.

Committee Helps Give Industry Technical Men

By F. G. Sefing,* Chairman, Committee on Cooperation with Engineering Schools.

LIKE all other metal industries, the foundry will continue to make tremendous strides both technically and economically during and immediately following the war. However, to carry these advances forward in competition with other industries requires men of equal or superior technical ability to those in other lines of manufacturing.

From the work of the Committee on Cooperation with Engineering Schools, there are many schools prepared to supply the foundry industry with young technically trained men. Foundries have, however, availed themselves all too seldom of this supply of engineering skill. Until the foundries show an interest in young engineers we cannot expect the young engineers to show an interest in the foundry industry.

Stimulates Research

Over the years the committee has had, as a major activity, the assisting of the staff of engineering schools by providing information on castings research projects and advising on how these may be carried on. Many of these projects have been reported through papers presented at A.F.A. meetings.

At the same time, then, that our committee is stimulating interest among young engineers both in the use of castings and in the foundry industry as a profession, it is our responsibility to promote more active interest among foundry executives to employ young engineers. This last matter is planned to be discussed at the annual meeting at the St. Louis Convention on Wednesday evening, April 28, by W. W. Rose, Exec. Vice-President, Gray Iron Founders' Society, Cleveland, Ohio. He will address the meeting on the present and future viewpoint of the foundry regarding engineering graduates. Mr. Rose will show what foundrymen can do to avail themselves of young engineering talent and what an asset this assistance can become to a foundry organization.

*International Nickel Co., New York.

★

Job Evaluation, Time and Motion Study Are Important

By Frank E. Wartgow,* Chairman, Job Evaluation and Time Study Committee.

THE success of evaluating jobs and of properly conducted time and motion study in other industries brought these subjects to the attention of the foundry industry. The interest in these subjects resulted some years ago in the appointment of a committee to study these subjects as they apply to the foundry industry. The work of this committee has been to educate foundrymen concerning the application of these various processes to their individual plants. For several years the committee has sponsored sessions at annual conventions of the American Foundrymen's Association, to which such outstanding authorities on these subjects as A. L. Kress, Phil Carroll, Jr., E. L. Berry, R. H. Landes, and Wm. Odom have presented discussions. Some sessions had been conducted as round table discussions with members of the committee acting as discussion leaders.

When the committee began its activities, it did so with some trepidation, wondering just what the interest of the foundrymen would be on these subjects. The answer was soon apparent when

*American Steel Foundries, East Chicago, Ind.

attendance at sessions sponsored by this committee were beyond expectation each year and the demand for papers and proceedings of meetings on these subjects generally greatly exceeded their availability through the National office.

The continued requests for information on job evaluation and time and motion study indicate the continued interest in these subjects. Again, at the St. Louis annual meeting this year, the committee is sponsoring a round table meeting. In addition to this meeting, there will be a speaker from the War Manpower Commission, Training Within Industry program, and its Job Methods Training program. This session should be very interesting because of the present manpower situation and should carry out the aim of the committee to provide the foundrymen with better methods which, in turn, mean lower costs and relief of the manpower shortage.

★

Manpower Supply Aided by Apprentice Training

By J. G. Goldie,* Chairman, Apprentice Training Committee.

THE Apprentice Training Committee is the oldest standing committee appointed by the American Foundrymen's Association. As a result, papers and discussions presented before its various meetings answer practically every question regarding apprentice training in foundries. The standards which this committee has set up for foundry and patternmaking apprentices have been recognized and adopted by the Federal Committee on Apprenticeship. This committee can well boast that it has fought a valiant fight, and the results of its activities are now more apparent than ever.

Since its inception, this committee has promoted apprenticeship in all its various phases. Its members eat, sleep and work for apprenticeship. They believe that no industry can prosper if it does not train new blood and that the surest, cheapest and best way to do this is through regular apprenticeship.

Program Is Hampered

With the country at war and the lack of skilled manpower, apprenticeship training has suffered somewhat because there is not time to give men an all-around training in a trade. Also, the most likely prospects for apprenticeship are now going into the services of our country.

These factors have changed somewhat the manner in which the Apprentice Training Committee can function. It might be said that under present circumstances, apprentice training is coasting, planning for the future, but not losing any ground. As a whole, those who believe in apprentice training are hanging desperately to all those points for which they have so long fought. They are determined that there shall be no short cuts to apprenticeship. However, they do realize the present manpower situation and have now taken up the training of men and women for one particular job in line with the defense and war production training programs.

The committee is now engaged in a study to set up these short-time training courses. The committee has been called on and its personnel has cooperated in many local, state and national conferences and has been active in them because the sponsors have realized the experience of its personnel.

*Instructor in Foundry Practice, Cleveland Trade School.

Refractories Committee Studies Proper Application

By J. A. Bowers,* Chairman, Refractories Committee.

THE Refractories Committee is one of the oldest A.F.A. committees. Through the years, this committee has endeavored to bring both ferrous and nonferrous foundrymen pertinent data regarding all types of refractories along with their recommended service.

One of the committee's biggest problems has been the average foundryman's lack of technical knowledge of the chemistry and manufacturing practices of refractories.

This problem gradually has been overcome through the technical papers, both theoretical and practical, as well as the discussions, presented at the technical sessions at each convention. The committee endeavors each year to secure papers from the manufacturer as well as the foundryman so that they may understand each other's problems and benefit by each other's criticism and advice.

The data presented at these sessions have covered not only manufactured refractories but natural ones. They have included information concerning specially manufactured shapes, methods of installation, chemical and physical properties of refractories, length of refractory life under different operating conditions, maintenance and repair of refractories, insulating refractories, etc.

It can be seen from this that, even though the refractory field

(Concluded on Page 45)

*American Cast Iron Pipe Co., Birmingham, Ala.

A.F.A. and the WAR·EFFORT!

WHEN the present war began with the attack on Pearl Harbor by the Japanese and the declaration of war by the Axis countries, industry of the United States immediately realized that it had a job cut out for it. As one of the basic industries of the country, the foundry industry met the challenge by laying plans which resulted in greatly increased production of castings to be used directly in armament and in tools for the production of war material.

With the transition of foundries from civilian to war production, many plants were required to manufacture castings with which they were totally unfamiliar and in many instances from metals with which they had had no experience. Under these circumstances, it was a question of where they could secure information that might aid them in this transition.

As the technical and educational organization of the foundry industry, it was natural that the American Foundrymen's Association should be called upon to aid not only its members but many who were not members of the organization. The American Foundrymen's Association as a body and its members individually are doing all they can to be of the greatest possible help to the foundry industry, irrespective of whether those who ask for help are members or not.

War Production Congresses

When war was declared on Dec. 7, 1941, A.F.A. was planning its 46th annual convention and in conjunction, the First Western Hemisphere Foundry Congress for the purpose of cementing industrial relations with our sister South American Republics. While the Western Hemisphere session was carried out, some plans were immediately changed and the 46th annual convention became also the First War Production Foundry Congress of the present war. At this congress, a large number of technical and operating problems in connection with war production were discussed and the Congress was stated to be the most informative and worthwhile ever held by and for the foundry industry. The exhibit of foundry equipment and supplies increased the informative nature of the Congress and aided foundrymen in planning for the future.

The Second War Production Foundry Congress, to be held in St. Louis, April 28, 29 and 30, will continue to bring to foundrymen from all over the United States and Canada, information on production and operating problems and how they may be solved. With a full year of war production behind it, the industry now has a clearer conception of its problems many of which will be discussed and solved at the Congress. In addition to acting as a clearing house for the exchange of experiences, the newest information in many fields will be presented.

Publications

Naturally, the entire industry personnel is not able to attend these congresses on war production. If the information were limited to those who attend the purpose of the congresses would be limited. Therefore, the papers and discussions presented at formal sessions are published in permanent form for future reference to all who want them. The 50 volumes of information thus far published are replete with the 'know-how' on practically every phase of foundry operation and technique.

In addition, A.F.A. publishes books on selected subjects known to be required for the industry. Further, many of the papers presented at its annual meetings and congresses are available in pamphlet form. These books and pamphlets have been widely disseminated not only to foundries but to many branches of the government. Typical of a letter voicing thanks for assistance, is one from the U. S. Army Corps of Engineers, Engineering Board, which reads as follows:

"The Engineering Board would like to take this opportunity to express its appreciation and gratitude for the complete and valuable information submitted recently. This information is exactly what was desired and will offer valuable aid to us in our problems."

(Continued on Page 44)

WAR PROBLEMS COMMITTEES OF A.F.A. CHAPTERS

Last summer, because of the growing number of problems associated with the foundry industry's war effort, the National Office of A.F.A. suggested that the A.F.A. Chapters set up special War Problems Committees to assist members locally with questions of a technical or shop practice nature. Since then 14 Chapters have organized such committees, their personnel being shown on this and the opposite page. The men who serve on these committees, without renumeration, deserve special commendation for their spirit of cooperation. Such activities are of vital importance in the war production effort, the War Problems Committees rendering a valuable service in aiding the solution of "duration" problems quickly, accurately and without red tape or confusion.

Birmingham District

Chairman, Dr. J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham.

Central Indiana

Chairman, Harold Lurie, Cummins Engine Co., Columbus.

Castings Specifications

Harold Lurie, Cummins Engine Co., Columbus.

Gray Iron

R. H. Bancroft, Perfect Circle Co., Newcastle.

Malleable Iron

S. C. Wasson, National Malleable & Steel Castings Co., Indianapolis.

Steel Castings

I. R. Wagner, Electric Steel Castings Co., Indianapolis.

Brass

Chas. Beckett, Beckett Bronze Co., Muncie.

Aluminum and Magnesium

Chas. Gisler, C. & G. Foundry & Pattern Works, Indianapolis.

Chesapeake

Chairman, E. W. Horlebein, The Gibson & Kirk Co., Baltimore, Md.

Steel

H. F. Taylor, Naval Research Laboratory, Washington, D. C.
T. C. Worley, Bethlehem Steel Corp., Sparrows Pt., Md.

Gray Iron

Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.
F. G. Roemer, The Balmar Corp., Baltimore, Md.

Malleable Iron

David Tamor, American Chain & Cable Co., York, Pa.

Brass, Bronze & Aluminum

Earl J. Bush, Washington Navy Yard, Washington, D. C.
A. H. Hesse, Naval Research Laboratory, Washington, D. C.

Patterns

J. O. Danko, Danko Pattern & Mfg. Co., Baltimore, Md.
J. A. Heard, Crown Cork & Seal Co., Inc., Baltimore, Md.

Welding

Clyde L. Frear, Bureau of Ships, Navy Dept., Washington, D. C.

Job Training

D. F. Lane, Bethlehem Steel Corp., Sparrows Point, Md.
Geo. L. Webster, Baltimore Polytechnic Inst., Lutherville, Md.

Sand

C. M. Saeger, Jr., Bureau of Standards, Washington, D. C.

Chicago

Chairman, E. R. Young, Climax Molybdenum Co.

Vice-Chairman, L. L. Henkel, War Production Board

Secretary, N. F. Hindle, American Foundrymen's Assn.

Brass & Bronze

H. M. St. John, Crane Co.
C. K. Faunt, Christensen & Olsen Foundry Co.

Steel

L. H. Hahn, Sivyer Steel Casting Co.
F. S. Sutherland, Continental Roll & Steel Foundry Co., East Chicago, Ind.

Malleable

L. J. Wise, Chicago Malleable Castings Co.
W. D. McMillan, International Harvester Co., McCormick Works.

Cast Iron

L. H. Rudesill, Griffin Wheel Co.
J. H. Gellert, Nichol-Straight Foundry Co.

Aluminum

G. H. Starmann, Apex Smelting Co.

Magnesium

Dr. R. F. Thomson, Chrysler Corp., Dodge-Chicago Plant.

Sand

G. H. Curtis, Chrysler Corp., Dodge Chicago Plant.

Cincinnati

Chairman, Stanton T. Olinger, Cincinnati Gas & Electric Co.

Gray Iron

Jos. Schumacker, Cincinnati Milling Machine Co.

Non-Ferrous

Ed. Korten, Reliable Pattern & Foundry Co.

Pattern Making

Charles Appel, The Lunkenheimer Co.

Alloys

Earl Kindinger, Williams & Co., Inc.

Pig Iron

Robt. Ebersole, Miller & Co.

Scrap Iron

L. W. Pryse, Hickman Williams & Co.

Steel

J. B. Caine, Sawbrook Steel Castings Co.

Detroit

Chairman, F. A. Melmoth, Detroit Steel Casting Co.

Steel

Ernest Lancashire, Detroit Steel Casting Co.
R. J. Wilcox, Michigan Steel Casting Co.

Gray Iron

V. A. Crosby, Climax Molybdenum Co.
L. W. Thayer, Cadillac Motor Car Div.

Malleable

C. F. Joseph, Saginaw Malleable Iron Div., Saginaw, Mich.
G. L. Galmish, Michigan Malleable Iron Co.

Aluminum & Magnesium

M. E. Brooks, Dowmetal Foundry, Bay City, Michigan.

Brass & Bronze

J. P. Carritte, Jr., True Alloys, Inc.

Metropolitan

Chairman, J. S. Vanick, International Nickel Co., New York.

Aluminum, Magnesium, Light Metals

R. E. Ward, Bendix Aviation Corp., Bendix, New Jersey.

Steel

K. V. Wheeler, American Steel Castings Co., Newark, N. J.

Brass & Non-Ferrous Foundry

D. E. Broggi, Neptune Meter Co., Long Island City, N. Y.

Brass & Non-Ferrous Castings

S. Frankel, H. Kramer & Co., New York.

Pig Iron

N. Anderson, Debevoise-Anderson Co., New York.

Cupola Practice & Foundry Equipment

H. A. Deane, American Brake Shoe & Foundry Co., Mahwah, N. J.
D. J. Reese, International Nickel Co., New York.

Pressure Castings

R. J. Allen, Worthington Pump & Machinery Corp., Harrison, N. J.

Gating & Risering Small Castings

W. T. Dette, Robins Conveying Belt Co., Passaic, N. J.

Gating & Risering Heavy Gray Iron Castings

J. W. Reid, R. Hoe & Co., Dunnellen, N. J.
David MacIntosh, Sacks-Barlow Foundries, Inc., Newark, N. J.

Cores, Sand, Refractories

W. G. Reichert, W. G. Reichert Engineering Co., Newark, N. J.

Government Specifications

N. A. Kahn, U. S. Navy Yard, Brooklyn, New York.

Heat-Resisting Alloy Castings

E. Cook, American Brake Shoe & Foundry Co., Mahwah, N. J.

Michiana

Chairman, R. E. Patterson,
Elkhart Fdry. & Machine Co., Elkhart, Ind.

Advisory, Dr. E. G. Mahin,
University of Notre Dame, South Bend, Ind.

Magnesium, Aluminum & Brass

A. T. Ruppe, Bendix Products Div., Bendix Aviation Corp., South Bend.

Steel

Herman Hess, Clark Equipment Co., Buchanan, Michigan.

Malleable and Gray Iron

J. E. Drain, Oliver Farm Equipment Co., South Bend.

Northeastern Ohio

Chairman, F. G. Steinebach,
The Foundry, Cleveland.

Gray Iron

A. C. Denison, Fulton Foundry & Machine Co., Cleveland.
F. J. Dost, Sterling Foundry Co., Wellington, Ohio.
Wm. J. Feth, Forest City Foundries Co., Cleveland.

Malleable Iron

F. A. Stewart, National Malleable & Steel Castings Co., Cleveland.
J. H. Lansing, Malleable Founders' Society, Cleveland.
J. J. Witenhafer, Lake City Malleable Co., Cleveland.

Steel

Ralph R. West, West Steel Castings Co., Cleveland.
J. Trantin, Jr., Youngstown Alloy Casting Corp., Youngstown, Ohio.
C. W. Briggs, Steel Founders' Society of America, Cleveland.

Brass and Bronze

E. F. Hess, Ohio Injector Co., Wadsworth, Ohio.
G. L. Bierly, Mansfield Brass Foundry, Inc., Mansfield, Ohio.

Aluminum and Magnesium

Fred S. Wellman, Wellman Bronze & Aluminum Co., Cleveland.
H. C. Nicholas, Quality Castings Co., Orrville, Ohio.
H. J. Rowe, Aluminum Co. of America, Cleveland.

Patterns

J. V. Brost, Brost Pattern & Casting Co., Cleveland.
M. E. Kohler, Scientific Cast Products Corp., Cleveland.
J. S. Parker, Motor Patterns Co., Cleveland.

Pig Iron

T. G. Johnston, Republic Steel Corp., Cleveland.
A. D. Smith, Bethlehem Steel Co., Cleveland.
Wm. Ramsey, Pickands, Mather & Co., Cleveland.

Cupola Operation

W. O. Larson, W. O. Larson Foundry Co., Grafton, Ohio.
Wm. C. Manwell, Fulton Foundry & Machine Co., Cleveland.
Milton Tilley, National Malleable & Steel Castings Co., Cleveland.

Core Production

E. C. Zirzow, National Malleable & Steel Castings Co., Cleveland.
Wm. Kayel.

Philadelphia

Chairman, J. H. S. Spencer,
H. W. Butterworth & Sons Co., Philadelphia.

Quad City

Chairman, P. T. Bancroft,
Republic Coal & Coke Co., Moline, Ill.

A. H. Putnam, A. H. Putnam Co., Rock Island, Ill.
C. F. Burgston, Deere & Co., Moline.
W. E. Jones, Ordnance Steel Foundry, Bettendorf, Iowa.
C. S. Humphrey, C. S. Humphrey Co., Moline.
John Diedrich, Blackhawk Foundry & Machine Co., Davenport, Iowa.

St. Louis

Chairman, C. B. Shanley,
Semi-Steel Casting Co., St. Louis, Mo.

Vice-Chairman, L. V. Kleber,
General Steel Castings Corp.,
Granite City, Ill.

Secretary-Treasurer, John H. Williamson,
M. A. Bell Co., St. Louis.

L. C. Farquhar, American Steel Foundries, East St. Louis, Ill.
W. E. Illig, Banner Iron Works, St. Louis.
A. O. Nilles, Griffin Wheel Co., North Kansas City, Kans.
F. T. O'Hare, Central Brass & Aluminum Foundry, St. Louis.
L. J. Desparois, Pickands Mather & Co., St. Louis.
E. A. Goerger, City Pattern & Model Co., St. Louis.
H. Goodwin, Medart Co., St. Louis.
W. L. Kammerer, Midvale Mining & Mfg. Co., St. Louis.
F. B. Riggan, Key Co., E. St. Louis, Ill.
G. W. Mitsch, American Car & Foundry Co., St. Louis.
Jas. Roland, Fry-Fulton Lumber Co., St. Louis.
W. A. Zeis, Midwest Foundry & Supply Co., Edwardsville, Ill.

Western New York

Chairman, Wm. S. Miller,
Chas. C. Kawin Co., Buffalo, N. Y.

Gray Iron

Alex Rankin, Lake Erie Engineering Corp., Kenmore, N. Y.
M. W. Pohlman, Pohlman Foundry Co., Inc., Buffalo.

Malleable

J. W. Considine, Jewell Alloy & Malleable Co., Inc., Buffalo.
F. J. Wurscher, Acme Steel & Malleable Iron Works, Buffalo.

Steel

J. P. Begley, Pratt & Letchworth Co., Buffalo.
J. H. Sander, American Radiator & Standard Sanitary Corp., Buffalo.

Non-Ferrous

J. C. McCallum, McCallum-Hatch Bronze Co., Buffalo.
H. R. King, Metal & Alloy Specialties Co., Inc., Buffalo.

Wisconsin

Chairman, Wm. J. MacNeill,
Federal Malleable Co., Milwaukee.

Gray Iron

W. F. Bornfleth, Cutler-Hammer, Inc., Milwaukee.
John A. Lusk, Allis-Chalmers Mfg. Co., Milwaukee.
E. L. Roth, Motor Castings Co., W. Allis, Wisconsin.
L. V. Tuttle, Koehring Company, Milwaukee.

Malleable Iron

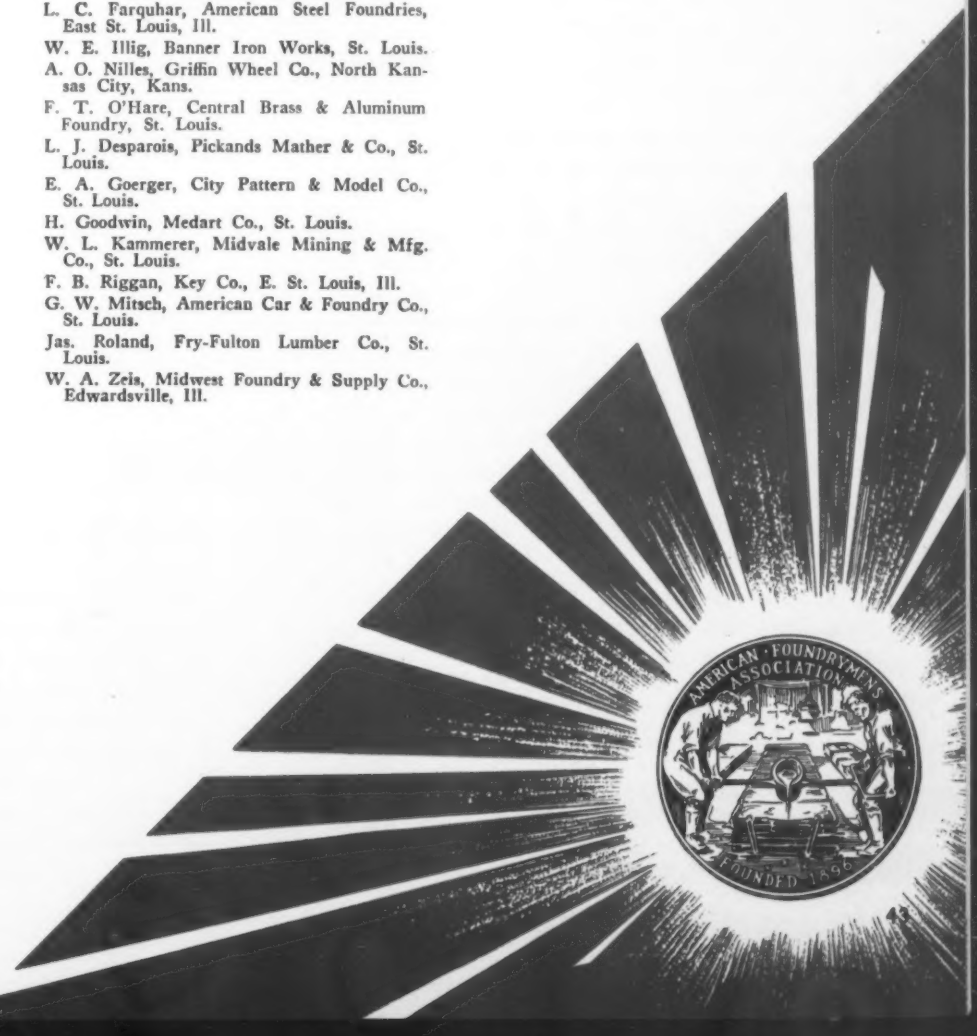
R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.
C. A. Gutenkunst, Jr., Milwaukee Malleable & Grey Iron Works, Milwaukee.

Non-Ferrous

Roy M. Jacobs, Standard Brass Works, Milwaukee.
V. C. Mekeel, Ampco Metal, Inc., Milwaukee.

Steel

A. T. Baumer, Wehr Steel Co., Milwaukee.
Carl F. Haertel, Falk Corp., Milwaukee.



A.F.A. and the WAR·EFFORT!

(Continued from Page 41)

The monthly publication *American Foundryman* has been used in many ways to assist in helping the government in its various activities in connection with the war effort. This magazine has cooperated with the War Savings Staff, Treasury Department, in the sale of War Bonds. It has publicized the scrap collection efforts and has published special information of particular interest to foundrymen. These efforts have been recognized, as indicated by the following excerpt from a letter received from the Conservation Division, War Production Board, which states:

"We appreciate very much the space which you have devoted to our down-grading chart as we feel that the publicity thus given will be a direct benefit to the war effort."

War Committees

One of the first committees organized following the declaration of war by Japan and the Axis powers was the War Activities Committee composed of the president of the Association and four additional members whose knowledge of their respective fields and of the foundry industry generally was unquestioned. At its first meeting, the committee reviewed extensively the committee work of the Association, stipulating which committees should be stimulated because of the contributions their work could render to the war effort and those whose work should be held in abeyance. The committee also suggested that War Problems Committees be organized by each of the 24 A.F.A. chapters to serve as local groups to aid foundrymen.

This suggestion was a very worthwhile one as these local War Problems Committees have served their purpose. Not only have they rendered service locally, but on several occasions the National office submitted problems to them which they have solved to the satisfaction of those involved. As an indication of this fact, we quote from a letter received from one company which asked assistance,

"I wish to express my appreciation for your help and the cooperation of these other gentlemen in helping us to lick this job. This certainly convinces us of the value of our connection with the American Foundrymen's Association."

Another company states:

"The information given is right to the point and comes from outstanding firms in the foundry industry. Thanks very much for the interest you have taken in the matter."

This is sufficient evidence that the Chapter War Problems Committees, whose personnel is listed herewith, are aiding the castings industry to solve its production problems.

War Production Clinics

In addition, Chapter War Production Problems Committees in several chapters have directly aided the War Production Board in staging War Production Clinics in various industrial centers throughout the country. Two such clinics have been staged in New York where the Metropolitan Chapter cooperated. Others have been staged in Buffalo, Indianapolis and Chicago in which Chapter War Problems Committees have assisted in staging the program. Similar clinics are being planned for other areas where chapters are located.

At the request of Washington authorities, certain Chapter War Problems Committees also have supplied the names of individuals who had manufacturing experience in enemy countries. Hence, the chapters, in addition to disseminating information on the latest up-to-date practices for producing castings, which certainly aids the production efforts of the industry and hence contributes to the war effort, are also cooperating with local and national government bodies for the industry in their respective localities.

Personnel Training

Manpower is one of the big problems of industry today and the foundry industry is no exception. Both nationally and locally, A.F.A. is cooperating with various government training groups. The work of the National Apprentice Training Committee has been approved by the Federal Committee on Apprenticeship. This committee now is also cooperating with the Job Training program of the Training Within Industry branch of the War Manpower Commission. Some chapters have appointed committees to assist in arranging War Training courses dealing with foundry practice and several are staging instructional type courses for the men in the shop.

(Concluded on Page 54)

Refractories Committee Studies Applications

(Concluded from Page 40)

is very broad, the committee has tried to cover it by obtaining technical papers concerning each subject. This year, in line with the National Conservation Program, that phase of the refractories problem will be discussed.

The members of the Refractories Committee also are helping to prepare the material for the refractories section of the new cupola handbook. The data that is being collected will include unpublished experiences as well as important and reliable information from past technical papers. Although this book is for cupola operators, the material to be included will cover refractory data that should be helpful to foundrymen in general.

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Committee Stresses War Time Maintenance

By James Thomson,* Chairman, Plant and Plant Equipment Committee.

WHEN every production minute counts and equipment is difficult to get, maintenance becomes an even more important consideration than normally. Realizing this, about 5 years ago the American Foundrymen's Association formed its Plant and Plant Equipment Committee.

The duties of this committee are to discuss and present maintenance problems and to provide a medium by which advances in equipment construction, operation and use may be brought to the attention of the members. Since its organization, the committee has sponsored sessions at annual meetings at which a number of papers have been presented dealing with some of the advanced, as well as everyday, foundry maintenance and equipment problems.

At the Second War Production Congress, a session of the same character is being provided. In addition to a discussion on foundry maintenance under wartime conditions, two papers are scheduled on the "Use of Infra Red Lamps for the Drying of Molds and Cores" and on "Core Sand Reclamation" as used by a leading aluminum and magnesium foundry. Both of these papers are of great interest because of the difficulty of securing drying equipment and because the type of sand used in the previously mentioned foundry, requiring a narrow range of fineness, is not widely available. Conservation of sand, of course, means decreased load on the transportation system, a point of great interest in the present crisis.

*Chief Plant Engineer, Continental Roll & Steel Foundry Co., East Chicago, Ind.

D. C. Williams Appointed A.F.A. Research Fellow

THE Subcommittee on Physical Properties of Steel Foundry Sands at Elevated Temperatures of the Foundry Sand Research Committee, announces the appointment of Douglas C. Williams, formerly connected with the research laboratories, American Steel Foundries, East Chicago, Ind., to the fellowship at Cornell University, Ithaca, N. Y., maintained by the Association for the study of the properties of foundry sands. Mr. Williams is a native of Illinois and was graduated from Beloit College, Beloit, Wis., in 1930 in chemistry and later studied engineering at Illinois Institute of Technology, Chicago. He had considerable experience as a chemist and engineer with such companies as the J. R. Short Milling Co., Chicago; E. I. Du Pont de Nemours Co., Wilmington, Del.; Delco-Frigidaire Division, General Motors Corp., Chicago, and various public utility companies prior to joining the research laboratory staff of the American Steel Foundries as chemical engineer. His work with the American Steel Foundries has been on steel foundry sands.

Douglas C. Williams

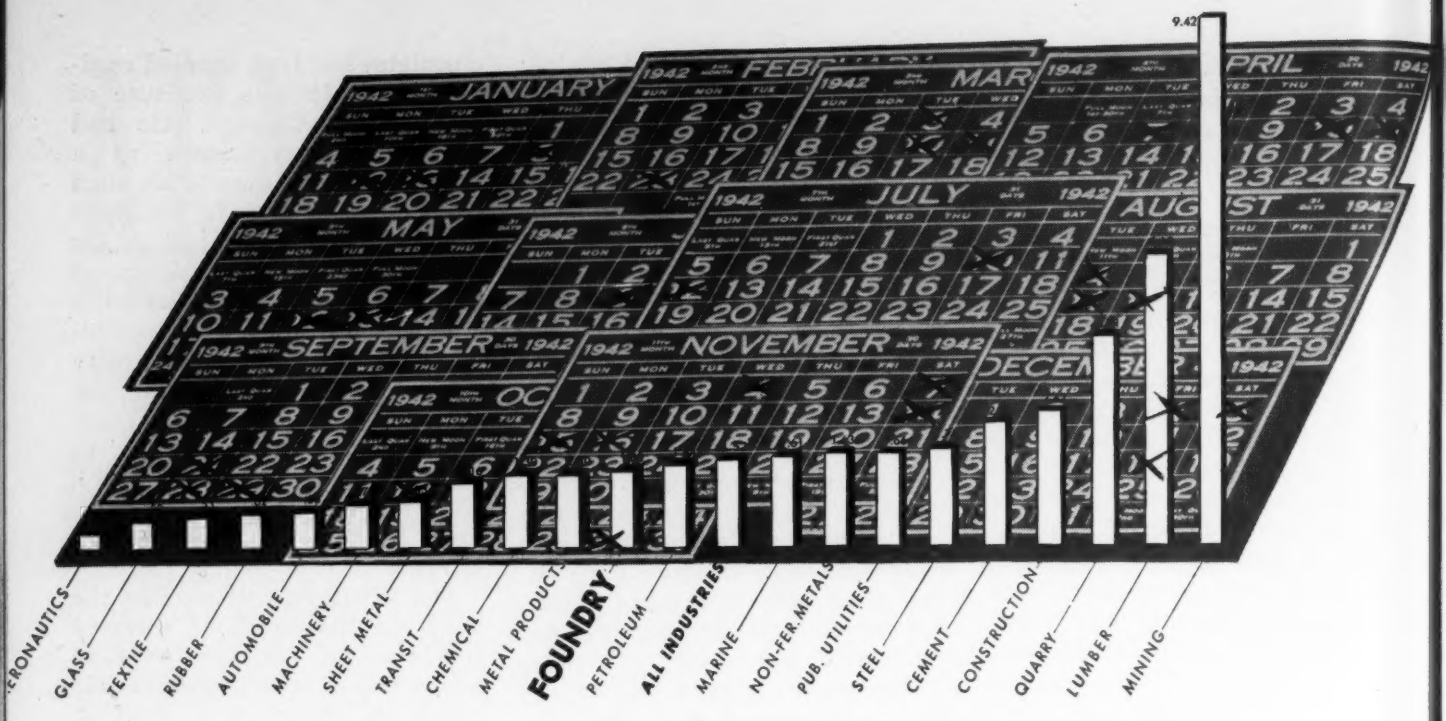
Mr. Williams will conduct the work on the effect of elevated temperatures on the physical properties of steel foundry sands under the direction of Prof. J. R. Moynihan, Head, Department of Engineering Materials, Sibley School of Mechanical Engineering, Cornell University. Dr. H. Ries, Technical Director, American Foundrymen's Association Foundry Sand Research Committee, Ithaca, N. Y., will act as advisor.

The work done by Mr. Williams will be reported to the Association in progress reports, three of which have been presented on similar studies.

Reichert Establishes Engineering Company

W. G. REICHERT has resigned as chief foundry metallurgist, American Brake Shoe & Foundry Co., Mahwah, N. J., to organize the W. G. Reichert Engineering Co., Newark, N. J. The new company will specialize in mechanization, appraisal and improvement of foundry operations, to increase production, improve the quality and aid management in the manufacture of centrifugal castings and the conversion of steel, gray iron and non-ferrous foundries for present and post-war needs.

Offices of the company are located in the Industrial Bldg., 1060 Broad St., Newark, N. J. Mr. Reichert has served as manager, metallurgical engineer, chemist and metallurgist in various foundries.



Where the Foundry Industry Stands in Nationwide Program to Cut Accidents

"THINK of it: 480 million man-days of industrial labor lost last year by reason of accidents—and the figure is going up!" Thus Donald Nelson, Chairman of W.P.B., has described the necessity for greater accident prevention in wartime.

A recent survey of the safety problem in *Fortune* magazine, based on National Safety Council data, presents interesting data on how and where accidents occur, and how they can be eliminated. Accompanying charts, reproduced by permission of *Fortune,* offer much food for thought for any foundry seeking to reduce its accident rate.

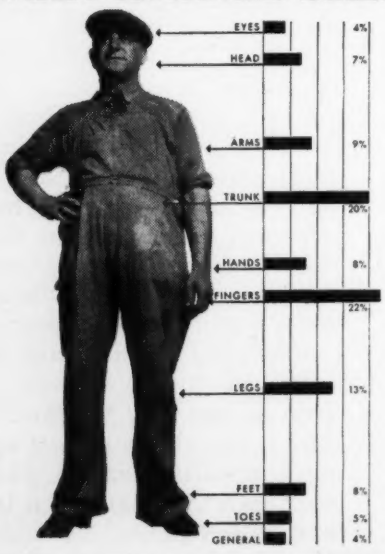
Foundry Not Most Hazardous

One chart (above) shows that accident severity is by no means highest in the Foundry Industry, the number of days lost being well below the average for all industries. Another chart (below, left) shows where injuries are most likely to occur to workers in our many war industries.

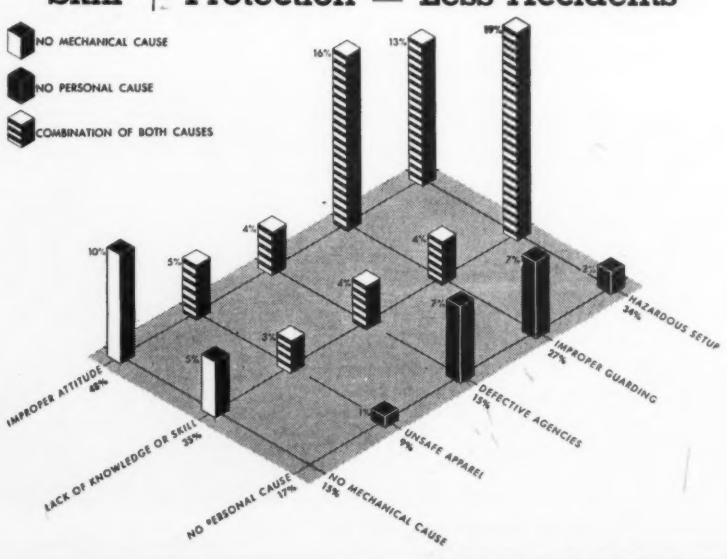
A third (below, right), emphasizes the point that "accidents don't happen, they are caused," by charting various sets of circumstances causing accidents. The most dangerous combination is one where men lacking in knowledge or skill encounter a hazardous setup.

All accidents have one thing in common: They can be eliminated, through education of workers, enforcement of safety

Where Accidents Strike



Skill + Protection = Less Accidents



Education succeeds best when rules, and safety engineering. workers take active part in the program. Enforcement calls for managerial courage. In final analysis, safety engineering and efficiency engineering are almost synonymous in dealing with the safety problem.

A.F.A. Safety Code

The survey brings into sharp focus the importance of the A.F.A. Recommended Code of Good Safety Practices for Protection of Workers in Foundries, developed by the Safety and Hygiene Codes Committee under chairmanship of Jas. R. Allan, International Harvester Co., Chicago. As a guide for a plant safety program, especially in small plants where the accident rate is high, the code offers efficient, practical and economical methods for reducing accidents and maintaining vital wartime production.

A.F.A. and Naval Research Laboratory Cooperate In Study of Sand Properties at High Temperatures

FOR many years, foundrymen have raised the question, "What happens to sand in a mold when metal is poured against it?" Six years ago, the Executive Committee of the Foundry Sand Research Committee decided to do something about it. Discussions at a meeting of that committee led to the formation of a Subcommittee on Physical Properties of Steel Foundry Sands at Elevated Temperatures under the chairmanship of D. L. Parker, General Electric Co., Everett, Mass. Steel foundry sands were chosen for investigation because such sands must withstand greater abuse, than other foundry sands, due to the high pouring temperatures of steel. It was thought that the information gleaned from such an investigation also would be applicable to other divisions of the castings industry because the effects are thought to be mostly of degree.

Following the appointment of the Subcommittee, meetings were held and a program worked out to secure practical information which the foundryman could use immediately. The results of preliminary work showed that, in the long run, a program to determine the effect of the different variables which were known to exist in foundry sand would be of great value. As a result, that additional phase was added to the investigation and a new program worked out.

Agree on Program

When the program of high temperature sand research was begun, the American Foundrymen's Association agreed to finance the program with the assistance of the steel foundrymen and funds were raised to begin the project. H. L. York was employed to conduct the investigation at Cornell Unitversity, Ithaca, N. Y., under the direction of the Subcommittee with Dr. H. Ries, technical director, Foundry Sand Research Committee, as advisor. Later Mr. York resigned and J. R. Young was appointed in his place. Although some difficulties beset the work in the beginning, these finally were overcome and three progress reports thus far have been published.

In reviewing these reports, few realize the amount of work that they represent. Literally thousands of tests must be per-

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NAVAL RESEARCH LABORATORY
ANACOSTIA STATION
WASHINGTON, D. C.

23 January 1943

Mr. N. F. Hindle, Asst. Secretary,
American Foundrymens' Association,
222 W. Adams Street,
Chicago, Illinois.

Dear Mr. Hindle:

Mr. Taylor, of this Laboratory, has discussed with you the matter of research work on the elevated temperature properties of steel molding sands to be done at the Naval Research Laboratory. We understand it is the desire of the Association that we incorporate in the program of the Laboratory such work as will facilitate the activities of your Subcommittee 6b7 and supplement that under way at Cornell University.

It is the policy of the Laboratory to give the steel castings industry as full advantage of our research work as possible and in war times to do the research that cannot be done by others. Accordingly to prevent duplication of effort and facilitate results, we will work in full cooperation with Cornell University and will fit the work of the Subcommittee into the Laboratory schedule to as great an extent as possible without interfering with other required work. We anticipate no change in the Laboratory's policy of reporting results of work in papers at AFA sessions and it will be satisfactory for you to announce the joint effort with Cornell if you wish.

Very truly yours,

R. W. Dole
Commander, U.S.N.
Assistant Director

formed to secure the desired information and all data must be checked thoroughly before publication. As a result, progress has not been as rapid as was desirable. That progress has been slow has been in no way the fault of the University or the personnel. It has been primarily due to apparatus difficulties and the large number of tests required. The apparatus problem has been solved but the large number of tests to establish proper "effect" curves still remained.

At a meeting of the Subcom- last year, it was suggested that the Naval Research Laboratory, Washington, D. C., be approached and asked to participate in the program. The committee appointed C. W. Briggs, Steel Founders' Society of America, Cleveland, to act as a committee of one, to approach the Naval Research Laboratory and suggest their participation. Mr. Briggs visited the Laboratory and found it receptive to the suggestion. After considerable correspondence, Chairman Parker is pleased to announce that the Naval Research Laboratory, of which Admiral A. H. Van Keuren is director and Commander R. W. Dole, assistant director, will soon begin cooperation with the Subcommittee and Cornell University in the project. The letter received from the Laboratory, signed by Commander Dole, is shown on the previous page.

H. F. Taylor Directs Work

Work on the high temperature properties of steel foundry sands will be carried out at the Naval Research Laboratory under the direction of Howard F. Taylor, recently appointed member of the Subcommittee, by R. E. Morey and Charles Clemons. It is expected that there soon will be an exchange of visits between the personnel of the two institutions, Cornell University and the Naval Research Laboratory, to lay a sound foundation for the cooperative work and to avoid duplication of effort in the program.

The American Foundrymen's Association joins the members of the Foundry Sand Research Subcommittee on the Physical Properties of Steel Foundry Sands at Elevated Temperatures in thanking the Naval Research Laboratory for the assistance it will render the castings industry in helping its members to better understand the reactions of foundry sand at elevated temperatures so that mixtures can be compounded in the future which will result in the increased quality and quantity of castings for our Navy and other armed forces.

War Manpower Commission Suggests Basic Steps in Up-Grading War Workers

INCREASING shortages of skilled labor have brought home the necessity for training of all available workers, green or semi-skilled, for vital war production jobs. Maximum utilization of workers' skills can be likened to wartime utilization of critical alloys in the metal-working industries. Just as alloys such as chromium, vanadium, tungsten, etc., are now being employed to greatest advantage where their use is mandatory, so must skilled labor be used on those jobs where most skill is required . . . by means of planned programs of upgrading.

One of the elements of the program, instructor training, has been presented before a number of A.F.A. Chapters, including the Michiana Chapter at its October 5 meeting. At that meeting representatives of the Training Within Industry branch of the War Manpower Commission gave an interesting demonstration of how the Government's Job Instructor Training program is being utilized to train instructors in war plants. This particular program, available to all plants engaged in war production work, has been used successfully in training hundreds of thousands of supervisors throughout the country.

The following article, reprinted in part from *Mill & Factory*, by A. N. Wecksler, October 1942, presents basic factors involved in an upgrading program.

Training Objectives

First step in planning a training program is a complete and thorough analysis of the job requirements, the number of workers to be trained, and broad specifications for the class and type of workers required. The problems will differ in each plant, but a general approach can serve as an index of possible solutions to specific problems.

Three steps normally taken in training production workers are: (1) Engineer the jobs; (2) instruct new workers on beginning jobs; (3) instruct experienced workers in new skills.

General objectives in breaking in new workers are:

1. Having the new worker come up to the quality and quantity requirements of production as quickly as possible.

2. Avoiding accidents which will injure the worker.

3. Avoiding damage to machines or equipment.

4. Spoiling as little work as possible.

Instruction of experienced or semi-skilled workers to do jobs requiring a higher degree of skill is being successfully accomplished through a carefully planned program of upgrading.

The Training Within Industry unit of the War Manpower Commission suggests the following outline as the basis for an upgrading program:

(1) *Determine lines of progression* (from what job to what job). Usually it is found that there are many groups of operations for which there are already natural lines of promotion. There are others, however, that do not fit into the normal promotional sequence and which should be fitted into the sequence to provide normal promotional opportunity and to prevent them from becoming "blind alley" jobs.

All the production jobs in the shop are listed in the order which indicates the lines of promotion from the lowest rated to the highest rated. This is done by departments, occupations, or whatever logical grouping of jobs obtains. In many cases this means movement from one department to another; for example, ma-

chine operator to apprentice tool maker, tool maker to tool design engineer.

"Line of progression" does not mean that movement from each job to the next is an immediate promotion. Before promotion to many jobs is possible, workers may be transferred to two or more jobs on the present level to prepare them for promotion. Perhaps two, three, or more workers are asked to "trade jobs" to give them necessary background and work experience.

Occasionally this means that workers must temporarily move to a lower rate job in order to get into a different line of work where eventually he can move "up the line" and into higher earnings. The line of promotion, therefore, indicates the order in which jobs must be learned, so that, if this learning order is followed over a period of time, each worker will be using his "best skill to the maximum of his individual ability."

Give Experience Necessary

(2) *Indicate experience necessary to qualify the employee for each job.* For each job, the operations which a qualified operator must be able to perform should be indicated.

This provides a ready reference for busy superintendents and foremen when promotions are considered. It is particularly helpful when planning transfers or rotations for workers who need additional experience and "rounding out" before qualifying for promotion.

This work can be completed in a short time—usually a day or two—and requires but a few minutes from time to time to keep up to date as jobs change. When completed, it is usually charted and distributed to all shop supervisors.

(3) *Determine where job rotation is applicable.* In those departments where all the employees perform work substantially of like difficulty, and where there are no "lines of promotion," about the only upgrading that can be done is job rotation. The benefits of this practice to employees and to the company will vary according to the kind of operation.

It is particularly useful in companies where there are frequent rush orders, emergencies, rapid expansions or seasonal fluctuations, engineering and model changes. To meet these problems promptly and efficiently, a flexible and versatile work force is highly desirable. The more jobs each employee can perform, the more useful he can be under a wide variety of conditions.

Some workers do not want to move —do not want to be "upgraded"— while others are anxious to master new skills. A program of job rotation is a good way to discover those employes who can learn several jobs, do so quickly, and who have enterprise and initiative.

An integral part of the training within industry and upgrading programs is the training of instructors who in turn are to instruct other workers.

Instructor Training

General suggestions concerning the handling of instructors follow:

1—Provision should be made for a proper wage differential between the rate for instructors and the top rate of the work classification for which they are training workers. This policy provides an incentive to experienced men to attain competence in instructing new workers.

2—Special instructors, skilled men trained as instructors or trained lead men, can safely handle 5 to 10 men on production work. A check sheet or record of the worker's performance, the speed with which the worker builds up skill, his method of doing the operations, rejects and spoilage and injuries, are points to be closely checked on the job by the supervision of training, as well as by production supervisors.

In many companies, special instructors report administratively to the foreman responsible for production and are a part of the regular production force, but are under the technical direction of the staff training supervisor.

3—Frequent visits to the shop where the new instructor is working should be made by the training supervisor.

4—After instructors have been on the job for a month or two, they should be brought back for a half day conference in which instruction techniques are reviewed in the light of actual teaching experience. Periodic conferences of this type will help the instructor to improve his effectiveness.

5—Periodic reports regarding the success of new workers thus trained should be made to upper management. Having authorized the program, executives naturally are interested in its progress and success.

Balanced Approach Needed

However, in formulating a labor training program, there exists the dual responsibility of meeting the current emergency and of providing a long term training program that will insure an adequate source of trained labor for future needs. A combination of the principles of apprenticeship and of the techniques of upgrading will provide a balanced approach to the total labor training problem.

Two Government units which are concerned with the training phase of labor are the Training Within Industry unit and the Apprentice Training Service. Both of these units are under the Federal Security Agency. The United States Employment Service is also concerned with the problems of worker training and of job analysis, but the interest of USES is primarily in pre-employment training.

Prior to the current emergency, the Apprentice Training Service worked to a large extent with labor organizations in establishing apprenticeship standards. War conditions have amplified the problems of skilled labor shortage to a degree that the problem is of equal concern to both management and labor.

The result is that the Apprentice Training Service is now emphasizing its service to management and can extend a concrete service, especially where the problem involves an agreement with a union concerning the training program.

No Labor Objections

Before the war emergency, there was some opposition from labor sources to large scale induction of new workers into the skilled trades. However, organized labor has recognized the fact that war industry requires a larger percentage of skilled workers in relation to the number of unskilled workers than is the case in normal peacetime operation.

A.F.A. Board Decries Excessive Entertainment

THE Board of Directors of the American Foundrymen's Association recently passed a resolution decrying excessive and unwarranted entertainment at the coming Second War Production Foundry Congress in St. Louis. The resolution, following the preamble, reads:

"Now, therefore, be it Resolved by the Board of Directors of A.F.A. that foundrymen, suppliers and all other interests concerned be urged to cooperate with the Association in promoting the objectives of this Congress and with the hotels in their efforts to carry out commitments made for the abatement of unwarranted excessive entertainment that would compete or detract from said objectives to the end that the St. Louis Congress be recorded as one of the great contributions of Industry to Winning this War."

Hotel reservation forms carry excerpts from the signed agreements entered into with the managers of all St. Louis hotels, as follows:

"No public space in the hotel is to be rented to any individual or firm for exhibit or entertainment purposes during the dates of the convention."

Causes of Failure of Patching and Daubing Mixes for Foundry Refractory Purposes

By A. R. Blackburn*, Columbus, Ohio

FOR years foundrymen have supplemented manufactured refractory brick and specialty mixtures with "shop-made" mixtures of siliceous material and clay. The compounding of this mixture varies as foundry practice itself, and ranges from a high ratio of clay to siliceous material to a low ratio, depending on the service for which it is intended. In some cases, the variation extends to the use of additional materials such as ground firebrick or calcined clay, organic binders and plasticizing agents.

Patching Mixtures

In the gray iron foundry, this mixture is used for cupola daubing and patching, to build cupola breasts, tap holes and slag holes, to line and wash troughs, to line ladles, and so on. In the steel foundry, it is used for electric furnace bottoms, and occasionally for furnace walls, to line all or parts of acid Bessemer convertors, for acid open-hearth furnace bottoms, for patch work, to line ladles, and so on. In the non-ferrous foundry, it is used to line or patch furnaces and to line ladles. In general, this mixture has been made the "handy man" of the foundry refractories.

The siliceous materials referred to are sands in any form, gannisters and quartzites, and the clay is the ordinary plastic fireclay. The better the quality of the raw materials, the greater is the control that can be exercised and the better the service results. However, for various applications, some shops will resort to the use of heap sands, "burnt" sands, or waste sand of some form, or to low quality clays, and it is easily seen that the control over mixtures employing such materials is impossible. In some foundries, this practice has been perfected to the point where an excellent service life has been obtained from these mixtures, while in others, by contrast, poor practice has resulted in poor service.

The following discussion points out the fundamental causes of the failures and poor service encountered in the use of these mixtures. However, this approach is theoretical, and allowance must be made for the fact that these basic fundamentals of refractory engineering are not an answer to all the problems and causes of failure, because of the wide variation in foundry practice and service conditions.

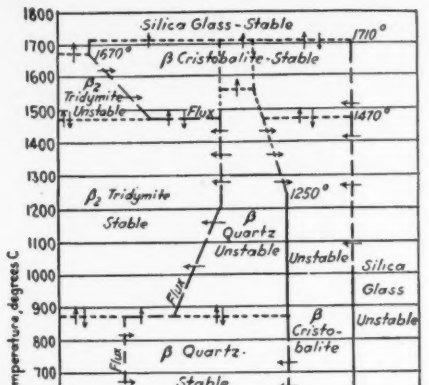


Fig. 1—Stability Relations of Silica Minerals (McDowell, revised).
From "Ceramics" by Hewitt Wilson

In a mixture of a siliceous material and plastic fireclay, two chemical compounds, silica and alumina, are the fundamental materials dealt with. Silica is the oxide of the metal silicon, and in its various forms occupies about 60 per cent of the earth's crust. Sand, gannister, flint, and quartzite are essentially silica. Clays and other natural materials contain a certain per cent chemically combined. Alumina is the oxide of the metal aluminum and occupies about 20 per cent of the earth's crust. A large percentage of the composition of clays is alumina and a certain amount is found in most of the other natural materials.

In this siliceous mixture, then, there is fundamentally silica and alumina, since the siliceous material is essentially all silica and the fireclay is a chemical combination of silica and alumina. There are other compounds present in small amounts, which are impurities with respect to the silica and alumina, and these impurities affect the quality of the material.

Silica

Silica in itself deserves considerable study as a refractory material and as a cause of trouble in refractory materials in which it is predominant. At high temperatures, it is one of the best refractories for, although the melting point of silica is not high with relation to some of the more refractory materials, it forms a viscous glass and has the property of remaining serviceable at temperatures very close to its melting point. However, at lower temperatures it has an unusual thermal expansion which is the cause of many failures in its use as a refractory. This unusual thermal expansion is caused by the inverting properties of silica.

Properties of Silica

When silica is subjected to heat and the temperature is raised, it changes its crystalline form, and accompanying this change of form is a volume change. The polymorphic or inverted forms of silica are low temperature (α) and high temperature (β) quartz, low temperature (α) and high temperature (β) cristobalite, and low temperature (α) and high temperature (β) tridymite. The in-

* Research Engineer, Engineering Experiment Station, The Ohio State University.

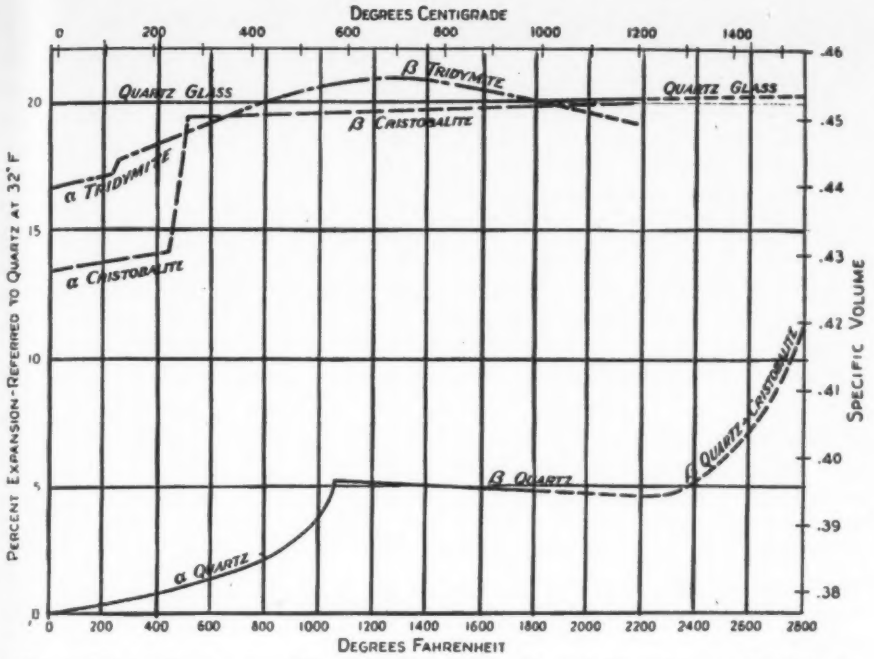

DEGREES CENTIGRADE
0 200 400 600 800 1000 1200 1400
QUARTZ GLASS
β TRIDYMITE
QUARTZ GLASS
β CRISTOBALITE
α TRIDYMITE
α CRISTOBALITE
β QUARTZ
β QUARTZ → CRISTOBALITE
α QUARTZ
PERCENT EXPANSION - REFERRED TO QUARTZ AT 32° F
SPECIFIC VOLUME
.46 .45 .44 .43 .42 .41 .40 .39 .38
0 5 10 15 20
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
DEGREES FAHRENHEIT

Fig. 2—Volume Temperature Characteristics of Silica Minerals (Day, Sossman, Hostetter).
From Transactions, American Society Mechanical Engineers

versions and their respective temperatures are shown in Fig. 1, and the expansion characteristics of these inversions and inverted forms are shown in Fig. 2.

Alpha cristobalite has about 13½ per cent greater volume, and α tridymite has about 17 per cent greater volume than α quartz. The troublesome expansion characteristics are shown by the 5 per cent expansion of α quartz up to 1050° F. in its inversion to β quartz, and the 5 per cent expansion of α cristobalite to β cristobalite between 450 and 500° F. As shown by the expansion characteristics, tridymite is the least troublesome form of silica for it has only a slight sudden expansion at about 250° F. However, as shown in Fig. 1, the tridymite inversion is sluggish and takes place to any extent only with the aid of a flux.

In the use of siliceous refractory mixes, these inversions and expansion temperatures must be treated with respect to obtain a maximum service life. Where the service conditions entail repeated heating and cooling through these inversion temperatures of quartz and cristobalite, the subsequent expansion and contraction can disrupt the lining and cause it to fail in spite of the fact that the heat resistant properties of the mixture are ample for withstanding the temperature to which it is exposed.

In the mixture of siliceous material and clay, not only must the thermal expansion of the silica, but also the thermo-chemical reaction of the basic constituents, silica and alumina, be treated with consideration for maximum service life. When these two compounds or materials containing these compounds as basic constituents are mixed, an unusual heat resistant phenomena is encountered. Figure 3 is the binary equilibrium diagram which shows the thermo-chemical reaction of all the possible combinations of silica and alumina. Although the diagram as shown requires considerable study for complete understanding, for this discussion only the "liquidus" line will be considered.

Thermo-Chemical Reactions

The liquidus line is the top range of solidity of any composition of silica and alumina provided equilibrium conditions are reached. In following the trend of the liquidus curve, it is seen that the refractory properties of the two compounds when mixed together are not additive. The presence of the silica not only lowers the melting temperature of the alumina, but in some combinations the melting temperature of the mixture is lower than either the silica or the alumina.

The liquidus curve drops rapidly to one point of melting which is lower than the others. This point is called the eutectic point, which is defined as the lowest melting point formed by any combination of materials.

The eutectic composition of silica and alumina is 94.5 per cent silica and 4.5 per cent alumina. The melting temperatures of compositions near this point drop rapidly, as shown by the liquidus curve, with a resulting small range of compositions which have a relatively low refractoriness.

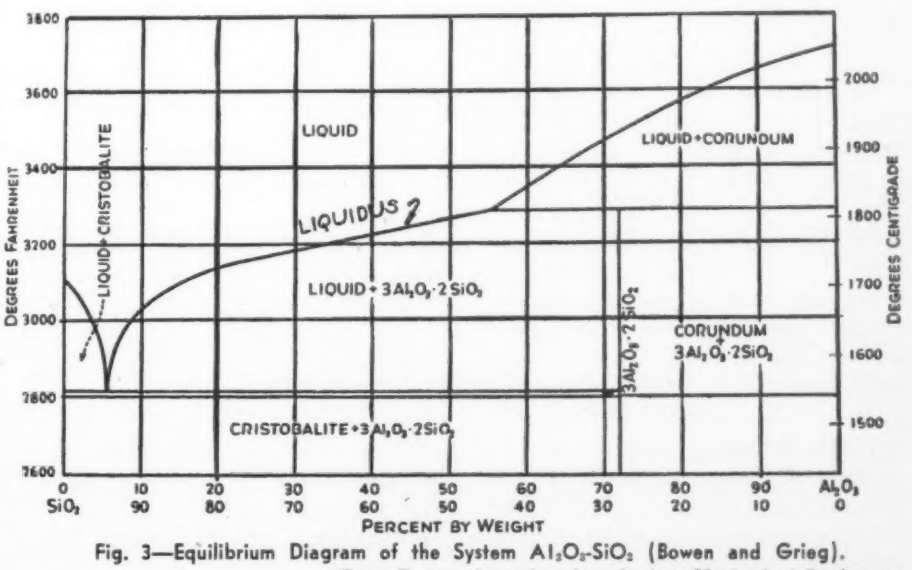


Fig. 3—Equilibrium Diagram of the System Al_2O_3-SiO_2 (Bowen and Grieg).
From Transactions, American Society Mechanical Engineers

Reactions in Shop Mixtures

In applying the diagram to these "shop-made" mixtures, the compositions of the mixture must be determined, based on the chemical composition of the clay and the siliceous material. With the calculated quantities of silica and alumina, the diagram may be used as an indication of the resulting refractory value of the mixture.

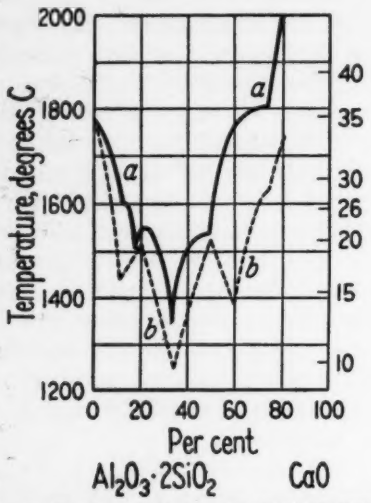


Fig. 4—Portion of System $CaO\text{-}Al_2O_3.2SiO_2$. Curve "a" Determined by Quenching Method (Rankin and Wright). Curve "b" Determined by Cone Deformation Method (Rieke).

From Journal American Ceramics Society

The composition of the majority of these mixtures as used in foundries is found to fall near the eutectic of the system, and in this range small changes in composition cause a rapid change in the melting temperature. Therefore, close control is essential for maximum service life.

Effect of Impurities

Despite the importance of this diagram, it can only be used as an indicator in forming mixtures in which silica and alumina are the predominant components. The diagram was prepared under ideal laboratory conditions with chemically pure materials, finely divided, and intimately mixed, which conditions are not duplicated in plant practice. The system also represents equilibrium conditions, which are very seldom if ever obtained in refractory usage. In addition the other constituents of the clay or siliceous material, which were termed impurities in the first part of the discussion, also affect the temperature reaction.

As an example, Figs. 4, 5, and 6 show the effect of lime (CaO), magnesia (MgO), and ferrous oxide (FeO), respectively, on kaolin ($A1_2O_3.2SiO_2$), which is one of the purer natural compositions of silica and alumina. In service these impurities are introduced into the reaction either by the materials of the mix or by the practice. These diagrams show that up to a certain amount, additions of these materials to kaolin (clay) lower the melting temperature. After the eutectic is reached, the melting temperature rises. However, with the quantities and the conditions encountered in foundry practice, it may be safely stated that these materials will lower the melting temperature of the silica-alumina mixture.

By comparison to the ideal conditions under which the diagram of the system was formulated, the mixture under service conditions actually consists of a "backbone" of grain-sized siliceous material surrounded by the plastic clay which is the matrix.

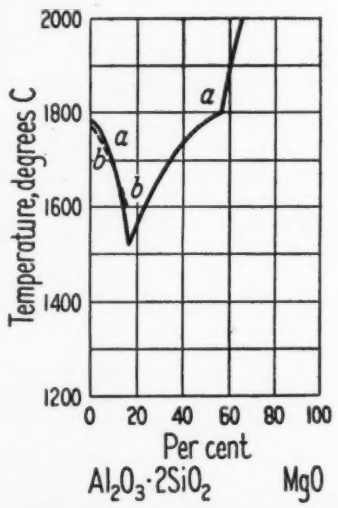


Fig. 5—Portion of System $MgO\text{-}Al_2O_3.2SiO_2$. Curve "a" Determined by Quenching Method (Rankin and Merwin). Cure "b" Determined by Cone Deformation Method (Rieke).

From Journal American Ceramics Society

The clay gives the mix its workability and its green and fired strength, but it is an impurity to the siliceous material and is the weaker part of the mixture from a refractory standpoint.

Service Conditions

In service, the physical reaction of the siliceous backbone is its inversion and subsequent thermal and permanent expansion. The thermo-chemical reaction begins with the clay which, as the weaker part of the mixture, breaks down first and attacks the silica. The extent and speed of the reaction depends in the first place on the ratio of silica to alumina in the clay plus the damaging impurities, and in the second place, on the alumina-silica ratio of the mixture plus the impurities. The binary equilibrium diagram will indicate the speed and extent of the reaction by means of the ratio of silica and alumina. It will not only indicate the heat resistant qualities of the mixture, but also its resistance to the attack of slag, molten metal and the other damaging service conditions.

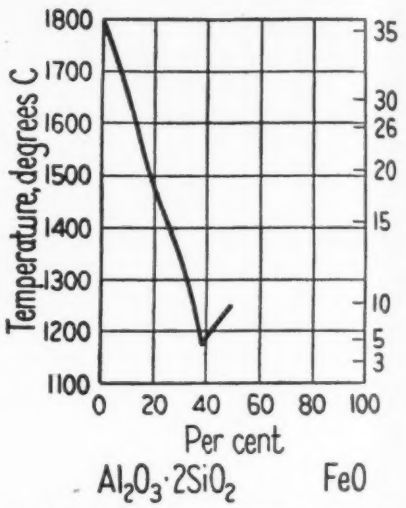


Fig. 6—System $FeO\text{-}Al_2O_3.2SiO_2$. Determined by Cone Deformation Method (Rieke).

From Journal American Ceramics Society

Flink Is Appointed Secretary of ASHVE

Carl H. Flink, formerly mechanical engineer in charge of product development laboratory, American Radiator and Standard Sanitary Corp., has been appointed technical secretary of the American Society of Heating and Ventilating Engineers, with offices at 51 Madison Ave., New York.

New Members

(February 16 to March 13, 1943)

Sustaining.

***Howard Foundry Co., Chicago, Ill. (F. C. Howard, Pres.)**

Conversions.

Company from Personal.

Edwin S. Carman, Inc., Cleveland. (Edwin S. Carman, Pres.)

Birmingham District Chapter

***Riddell Engineering Company, Inc., Birmingham, Ala. (E. E. Pollard)**

Chesapeake Chapter

Wm. S. Scheder, Baltimore, Md., Repr., Cleveland Tramrail Co., Wickliffe, Ohio.

Chicago Chapter

George Cantor, Welding Foreman, American Steel Foundries, East Chicago, Ind.
G. A. Dixner, Supt. of Melted Metals, American Steel Foundries, East Chicago.
Clarence A. Kasper, Apprentice, Continental Roll & Steel Foundry, East Chicago.
Andrew J. Mancos, Jr., Apprentice, Continental Roll & Steel Foundry, East Chicago.
Lawrence Simpson, Ass't General Fdry. Foreman, American Steel Foundries, East Chicago.

Cincinnati District Chapter

Frank Krautwater, Vice-Pres., The Parker Pattern & Foundry Co., Springfield, Ohio.
***Meierjohan-Wengler, Cincinnati (Herman Meierjohan)**

Detroit Chapter

Ernest M. Bahor, Met. Control Analyst, Ford Motor Co., Dearborn, Mich.
Milton J. Diamond, Saginaw Malleable Iron Div., General Motors Co., Saginaw, Mich.
Library—Engineering Laboratory, Ford Motor Co.
H. L. Gebhardt, Pres., United Oil Mfg. Co., Erie, Pa.
Harry E. Martin, Detroit, Mich., Dist. Sales Mgr., E. F. Houghton & Co., Philadelphia.
William C. Morgan, Detroit, Mich., Met., E. F. Houghton & Co., Philadelphia.
C. L. Secord, Industrial Engr., Aluminum Co. of America, Detroit.
C. P. West, Met. Chemist, Centrifugal Fusing Co., Lansing, Mich.

Eastern Canada and Newfoundland Chapter

E. Aubertin, Core Maker, Robert Mitchell Co., Montreal, Que.
A. Brazeau, Molder, Robert Mitchell Co., Montreal.
Cliff Gilbert, Supt., Cleaning Dept., Electric Steels Ltd., Cap de La Madeleine, Que.
George P. Graham, Tech. Repr., Canada Starch Sales Co., Montreal.
F. M. Johnson, Plant Supt., Wabi Iron Works (Quebec) Ltd., Noranda, Que.
F. Laurendeau, Molder, Robert Mitchell Co.
C. H. Nadeau, Core Maker, Robert Mitchell Co.
Victor Nole, Core Maker, Robert Mitchell Co.

Metropolitan Chapter

A. Joline, Casting Methods Engr., Wright Aeronautical Corp., Paterson, N. J.
Leo J. Katalinas, Leadman, Wright Aeronautical Corp., Paterson.
***Picker X-Ray Corporation, New York.**
Walter R. Scott, Chief Tech., Wright Aeronautical Corp., Plant No. 3, Fairlawn, N. J.
Dave W. Wuerthele, New York, N. Y., Ass't Dist. Sales Mgr., A. P. Green Fire Brick Co.

Northeastern Ohio Chapter

***The Barberton Foundry Co., Barberton, Ohio (Harold Walsh, Factory Mgr.)**
D. A. Carman, Draftsman, Edwin S. Carman, Inc.
E. Lawrence Carman, Draftsman, Edwin S. Carman, Inc., Cleveland.
Irvin E. Frye, Secretary, Edwin S. Carman, Inc.
Leo J. Ihrig, Atlantic Foundry Co., Akron, Ohio.
R. H. Melbourne, Chagrin Falls, Ohio, Agent, Adrian Production Tool Co., Adrian, Mich.
Kenneth H. Robbins, Prod. Control, Edwin S. Carman, Inc., Cleveland.
Chester Suskowiz, National Malleable & Steel Castings Co., Cleveland.
John Trhlik, Draftsman, Edwin S. Carman, Inc.
Ralph W. White, Operating Met., Cooper-Bessemer Corp., Grove City, Pa.

Northern California Chapter

O. K. Carpenter, Consulting Engr., Foundry, Kaiser Co., Inc., Iron & Steel Div., Oakland.
M. V. Crimmens, Molder, Enterprise Engine & Foundry Co., San Francisco.
Andrew Erne Perry, Molder, Enterprise Engine & Foundry Corp., South San Francisco.
S. B. N. Svendsen, Supt., Thys and Miller, Sacramento
T. R. Williams, Supt., Rich Mfg. Co., Oakland.
Pete Zuniga, Appr. Molder, Enterprise Engine & Foundry Co., South San Francisco.

Ontario Chapter

***Black Donald Graphite Ltd., Toronto, Ont. (A. K. Muir, Managing Director)**
***Chemical Oil Processing Co., Toronto. (D. Taylor.)**
***John East Iron Works Ltd., Saskatoon, Sask. (M. A. East, Managing Director)**
***Gilson Mfg. Co. Ltd., Guelph, Ont. (Roy Elsegood)**
Russell A. Telfer, Ass't Sec'y-Treas., Black Donald Graphite, Ltd., Toronto.

Philadelphia Chapter

R. J. Kelly, Sales Engr., Bridesburg Foundry Co.

Quad-City Chapter

Nazareno Rapagnani, Chief Chemist, Ordnance Steel Foundry Co., Bettendorf, Iowa.

St. Louis District Chapter

Richard A. Hepper, Vice-Pres., Puhl & Hepper Mfg. Co., St. Louis.

Southern California Chapter

***Ensign Carburetor Co. Ltd., Huntington Park, Calif. (Roy Finell, Fdry. Foreman)**
H. P. Nielsen, Met., Kinney Aluminum Co., Los Angeles.
***O'Keefe & Merritt Co., Los Angeles. (Lawrence Matranga, Fdry. Foreman)**

Twin-City Chapter

Kenneth Moore, Molding, Minneapolis Electric Steel Casting Co., Minneapolis, Minn.

Western Michigan Chapter

M. A. Bell, President, Newaygo Engineering Co., Newaygo, Mich.
Harry A. Kaselan, Engr., Newaygo Engineering Co.
H. J. Krause, V. P., Newaygo Eng. Co., Newaygo.

Western New York Chapter

***Lakeside Bronze, Inc., Buffalo, N. Y. (L. G. Smith, Pres.)**

Wisconsin Chapter

Jack J. Pechacek. Research Dept., Allis-Chalmers Mfg. Co., West Allis, Wis.
George Rothenmaier, Ampco Metal, Inc., Milwaukee
Arthur Speerbrecher, Head Inspector, Allis-Chalmers Mfg. Co., Milwaukee.

Outside of Chapter

John William Gardom, Consulting Engr., Ripley, Derbyshire, England.
Hugh P. Hughes, Met., T. Robinson & Son, Ltd., Railway Works, Rochdale, England.
T. C. Lay, Worcester, Mass.
Frank L. Railingshafer, Ass't Supt., Fort Pitt Steel Casting Co., McKeesport, Pa.
N. E. Rambush, Managing Director, Ashmore, Benson, Pease & Co., Ltd., Parkfield Works, Stockton-on-Tees, England.
Carl E. Schubert, Asst. Prof. Mech. Engr., University of Illinois, Foundry Lab., Urbana, Ill.

*Company members.

A.F.A. and the War Effort

(Concluded from Page 44)

Product Usage

There has been an opinion among foundry metallurgists for several years that cast iron, under suitable conditions, could be used above 450°F., the temperature limitation given in most use codes. Considerable work has been done in investigating high temperature properties of cast iron, and it was thought that there were many installations where the maximum temperature exceeded 450°F.

In this era of critical materials, it is only good practice to use all materials to their maximum extent in proper applications. The use of cast iron at temperatures higher than mentioned was brought to the attention of the War Metallurgy Committee of the National Academy of Science, National Research Council, by the A.F.A. Gray Iron Division Committee on High Temperature Properties of Cast Iron. The War Metallurgy Committee was interested in the prospective use of cast iron at higher temperatures than those to which its use is at present restricted and authorized an investigation on the theory and application of cast iron at temperatures above 450°F.

A survey has been completed and the report will be discussed at St. Louis at the Second War Production Foundry Congress. During the survey and investigation, the Gray Iron Division Committee on High Temperature Properties of Cast Iron has acted in an advisory capacity to the War Metallurgy Committee.

Plant Protection

The contribution of the A.F.A. Industrial Hygiene Codes Committee in producing a "Code of Recommended Practices for the Protection of Life, Property and Production in the Foundry Industry During the War," which has served as the "bible" on this subject throughout the foundry industry, has been recognized nationally. This code was so outstanding that it was approved by the Office of Civilian Defense, Washington, D. C., and served as the basis for the Chicago Metropolitan area code for protection of industries within that area. Later, it served as the basis for a plant protection code promulgated by the State of Wisconsin and its recommendations are being followed in many other areas.

Specifications

Specifications are an important phase of war production. The American Foundrymen's Association recognizes the American Society for Testing Materials as the specifications making body of the foundry industry and as such, A.F.A. is represented officially on all A.S.T.M. committees which have to do with castings specifications. These representatives have taken part in formulating National Emergency Specifications and Alternates. Many companies now making war products have not previously worked to certain specifications and A.F.A. has assisted those companies in securing information concerning a great variety of product control specifications. This is but one phase of the large question and answer service which A.F.A. maintains in the National office and which is being handled so well locally by its Chapter War Problems Committees.

International Relations

Prior to the present war, there existed an International Committee of Foundry Technical Associations which staged international and European foundry congresses. Many of the organizations which were members of the committee have ceased to exist, but the American Foundrymen's Association still maintains relations with the Institute of Australian Foundrymen, the Institute of British Foundrymen and the foundrymen of Brazil, through official representatives of A.F.A. in those countries and through the medium of exchange papers giving information on foundry processes as they exist in those countries.

From the above, it will be seen that A.F.A. is contributing all within its power to the winning of the war. It has rendered assistance to many government agencies having to do with foundry products, it is rendering a service both nationally and locally on problems connected with the production of war material, and it is maintaining the contact among the foundry organizations in the United Nations countries, helping to cement international relations. Thus it can truly be said that A.F.A. is actively assisting locally, nationally and internationally to assure Victory.

Bolton and Reichert to Give Lectures at St. Louis

(Concluded from Page 27)

The present series of lectures to be given by Mr. Reichert is one in a program which is being sponsored by the Annual Lecture Course Committee of A.F.A. which is composed of H. M. St. John, Crane Co., Chicago, Chairman; H. Bornstein, Deere & Co., Moline, Ill.; John Howe Hall, General Steel Castings Corp., Eddystone, Pa.; and F. J. Walls, International Nickel Co., Inc., Detroit. Previous lecture courses sponsored by this committee have been those on "The Microscope in Elementary Cast Iron Metallurgy" by R. M. Allen, consulting engineer, Bloomfield, N. J., in 1939; a series of demonstrations by Dr. C. W. Mason, Cornell University, Ithaca, N. Y., on crystallization, at the 1940 convention, and the series on "Modern Core Practices and Theories" by H. W. Dietert, H. W. Dietert Co., Detroit, at the 1941 and 1942 conventions. Two of these lecture series have resulted in books which have been published by the Association, and it is hoped that the present series by Mr. Reichert will result in a book on the subject which he is covering.

1942-1943 Chapter Chairmen

UPON these two pages, A.F.A. presents most of the chairmen of its 24 chapters located in foundry centers throughout the United States and Canada. Upon these men has rested the responsibility for the activities of their respective chapters during this year. The only chapter chairmen missing are R. T. Rycroft, Jewell Alloy & Malleable Co., Inc., Buffalo, N. Y., chairman, Western New York Chapter, and C. J. Lonnee, Muskegon Piston Ring Co., Sparta, Mich., chairman, Western Michigan Chapter. Unfortunately, the Association was unable to secure their photographs by the time this issue of *American Foundryman* went to press.

C. B. Shanley, Semi-Steel Casting Co., St. Louis, Mo., chairman, St. Louis District Chapter, which is host to the 1943 War Production Foundry Congress, likewise is missing from this group, but is shown together with the other officers and directors of that chapter, plus the chairmen, vice chairmen and secretaries of St. Louis District Chapter Congress Committees, on pages 17 to 20, inclusive, of this issue.

Hats off to your chapter chairmen!

A. G. Gierack
American Manganese Steel Div., American Brake Shoe & Foundry Co.
Chicago Heights, Ill.
Chicago Chapter

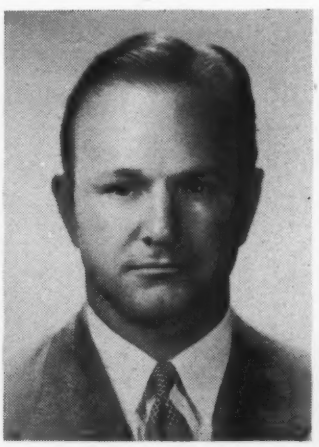
J. H. Tressler
Hickman-Williams & Co., Cleveland
Northeastern Ohio Chapter

A. D. Matheson
French & Hecht, Inc., Davenport, Iowa
Quad City Chapter

F. A. Melmoth
Detroit Steel Casting Co., Detroit, Mich.
Detroit Chapter

Douglas J. Peake
Florence Pipe Foundry & Machine Co., Florence, N. J.
Philadelphia Chapter

F. A. Mainzer
Pacific Brass Foundry of San Francisco
San Francisco, Calif.
Northern California Chapter



G. K. Dreher
Ampco Metal Inc.
Milwaukee
Wisconsin Chapter

E. A. Thomas
Thomas Foundries, Inc.
Birmingham, Ala.
Birmingham District Chapter

Earl Anderson
Enterprise Iron Works
Los Angeles, Calif.
Southern California Chapter

F. G. Sefing
International Nickel Co.
New York, N. Y.
Metropolitan Chapter

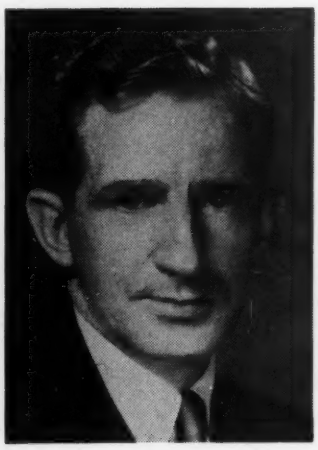
Max J. Reuteler
Fairbanks Morse & Co.
Beloit, Wis.
N. Ill.-S. Wis. Chapter

J. J. McFadyen
Galt Malleable Iron Co.
Galt, Ont., Canada
Ontario Chapter

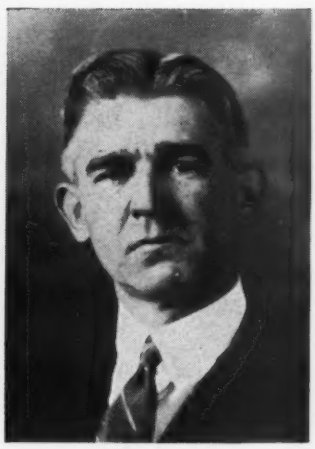
H. Klouman
Michigan Products Co.
Michigan City, Ind.
Michiana Chapter

L. D. Wright
U. S. Radiator Corp.
Geneva, N. Y.
Central N. Y. Chapter

Frank Hutchinson
Reliance Foundry Co.
Cincinnati, Ohio
Cincinnati Chapter



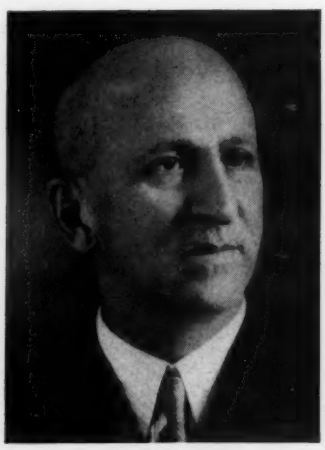
B. P. Mulcahy
Citizens Gas & Coke Utility
Indianapolis, Ind.
Central Indiana Chapter



J. E. Crown
U. S. Navy Yard
Washington, D. C.
Chesapeake Chapter

R. M. Aker
Western Alloyed Steel
Casting Co.
Minneapolis, Minn.
Twin City Chapter

Chas. F. Carson
National Supply Co.
Toledo, Ohio
Toledo Chapter



Robert H. Bartram
Robert W. Bartram, Ltd.
Montreal
E. Canada and Newfound-land Chapter

Harry R. Dahlberg
University of Minnesota
Student Chapter

Chapter Activities

Shipyard Use of Welding and Casting Told at Phiadelphia

By W. S. Thomas,* Philadelphia, Pa.

THE February 12 meeting of Philadelphia Chapter was held at the Engineer's Club and was jointly conducted by the Philadelphia Chapter of the American Welding Society.

The 250 members and guests of both societies who attended were privileged to hear two very fine talks. One was by Michael (Mike) Dorizas, world-known traveler and lecturer of political history, who talked on the present war situation in Europe and the possible effects that it would have on these countries.

The technical part of the meeting was ably handled by Paul Ffield, Materials Engineer, Ship Building Division, Bethlehem Steel Co., Quincy, Mass. Mr. Ffield, with the aid of numerous slides, told an interesting story regarding the advancement made in welding technique, particularly applied to ship building and principally to steel castings.

The speaker discussed the early work of the ship builder in the radiography and repairing of steel castings. He explained the extent of this work and how welding was later used to simplify foundry problems. Examples of complicated castings were shown which were subdivided into simple-to-cast components where the individual casting was welded together either at the foundry or the ship yard.

Mr. Ffield explained how it was only a matter of time before the experience gained in the welding of steel castings was used to salvage castings which had been machined and which sometimes had been in service. At the Fore River Yard of the Bethlehem Steel Co., considerable work is being done along these lines. On finished machine castings weighing up to 90 tons, which were salvaged by the use of a proper welding and heat treatment technique to avoid or correct distortion, slides were shown describing this.

He also explained how this experience was correlated to repair and salvage a battle-damaged steel casting. Some of the unusual incidental problems connected with the welding of ships were explained by Mr. Ffield, particularly the welding of high pressure steam piping, including cast fittings, and some corrosion problems associated with welding and casting.

*North Bros. Mfg. Co., reporting for Philadelphia Chapter of A.F.A.

(Courtesy John Bing, A. P. Green Fire Brick Co.)

Personalities at the Successful Wisconsin Conference held on Feb. 18-19 at Hotel Schroeder, Milwaukee.

Quiz Night Held at Montreal Meeting

By A. E. Cartwright,* St. Laurent, Can.

A RECORD attendance of over 150 enthusiastic members and guests of the Eastern Canada and Newfoundland Chapter turned out for a free-for-all discussion of foundry problems at the February 19 meeting held at the Mount Royal Hotel, Montreal. In the absence of Chairman C. C. Brisbois, due to illness, Honorary Chairman R. W. Bartram, Robert W. Bartram Ltd., Montreal, presided. As the meeting was a quiz night, a roster of "experts" was called upon to provide factual, or at least, plausible answers to a variety of questions ranging from reasons for greater or lesser shrinkage between non-ferrous alloys, to methods of making thin cast iron plate of large area without warping. Sand qualities and control also came in for prominent consideration.

G. E. Tait, Dominion Engineering Works Ltd., Lachine, acted as question distributor and did an excellent job of handling them in a sequence to maintain interest on the part of the audience and equitable demands on the "experts." Comments on the part of many of the members of the audience indicated that further programs of this type would be welcome.

At a preliminary executive meeting, a Nominating Committee, composed of W. G. E. Burgess, Jenkins Bros., Ltd., Montreal; P. P. S. Chapman, Canadian Car & Foundry Co., Ltd., Montreal; and J. Newman, Canadian Foundry Supplies & Equipment Ltd., Montreal, was chosen to select a slate of officers for the next season.

*Chief Metallurgist, The Robert Mitchell Co. Ltd.

Converter Is Subject at Northeastern Ohio

By Pat Dwyer,* Cleveland, Ohio

MEMBERS and guests of of the Northeastern Ohio Chapter attending the March 11 meeting at the Tudor Arms, Cleveland, heard A. W. Gregg, Executive Engineer, Equipment Division, Whiting Corp., Harvey, Ill., discuss "The Cupola's Place in Steel Production Today."

Before the technical session started Vice Chairman James G. Goldie, Cleveland Trade School, announced the appointment of a nominating committee, including the seven past presidents of the chapter, to select a slate of officers for the coming year. Popularity of certain programs during the past year influenced the directors in the decision to present another "quiz night" at the April meeting. Formality will be relaxed at the May meeting when the Old Timers will be recognized as guests by the "Young Timers and Some Timers."

Mr. Gregg pointed out that the present day controls for converter steel, and especially the ability to produce low sulphur steels, have brought about a revival of interest in the use of the converter. He stated the quality of converter steel, according to impartial tests, is equal to that of steel made by any other process. All processes can produce good steel if properly operated and conversely any process will produce inferior steel if not properly operated. The speaker then outlined the advantages and disadvantages of the process.

A motion picture showing the operation of two large cupolas supplying hot metal as part of the charge in open hearth furnaces concluded the program. In response to the speaker's invitation a considerable amount of lively, and at times controversial, discussion enlivened the proceedings.

*Engineering editor, *The Foundry*.

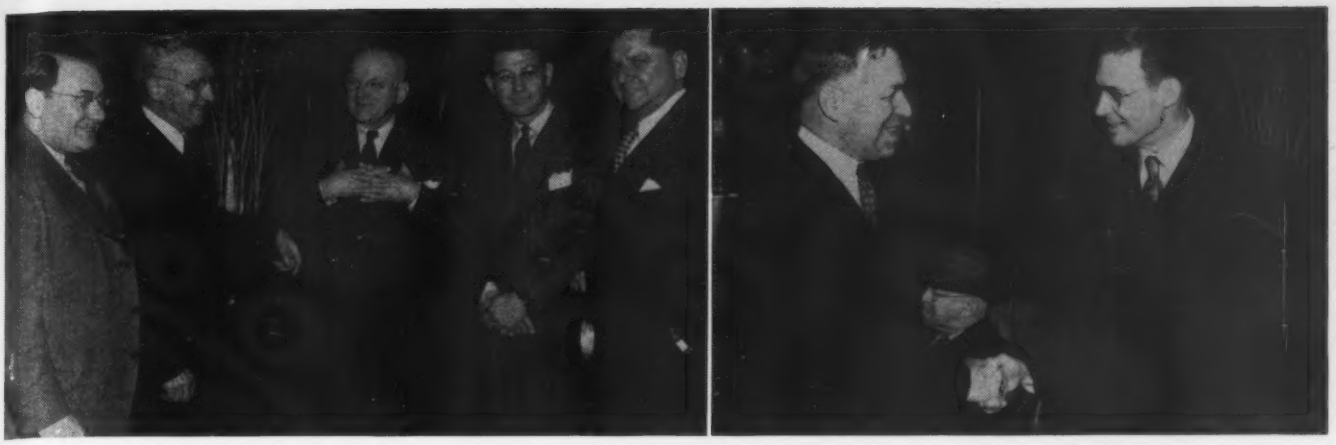
Central Indiana Hears Talk on Aluminum

By R. A. Thompson,* Indianapolis

THE Central Indiana Chapter held its March 1 meeting in the Washington Hotel, Indianapolis, with R. A. Thompson, Electric Steel Castings Co., Indianapolis, chapter secretary, presiding. The meeting was very

*Electric Steel Castings Co., and Secretary, Central Indiana Chapter.

Popularity of the "Quiz Night" held Feb. 19 by the Eastern Canada and Newfoundland Chapter is evidenced by the attendance at that meeting.



(Courtesy W. W. McCullough, American Cast Iron Pipe Co.)

Personalities at the Birmingham District Regional Conference. On the Left—Left to Right—E. H. King, Hill & Griffith Co., Cincinnati Chapter Vice Chairman; R. E. Kennedy, Association Secretary; W. Carson Adams, Birmingham Chapter Vice Chairman; Warren E. Whitney, National Cast Iron Pipe Co., toastmaster at Annual Conference Dinner; L. N. Shannon, Stockham Pipe Fittings Co., A.F.A. Past President and Birmingham Chapter Past Chairman. On Right—R. A. Donaldson, Woodward Iron Co., congratulates E. L. Shaner, President, Penton Publishing Co., Cleveland, on his speech at the Annual Conference Dinner.

well attended and great interest was shown in the address of the speaker of the evening, H. J. Rowe, metallurgical engineer, foundry division, Aluminum Corp. of America, Cleveland, Ohio. Mr. Rowe described various practices used in the production of aluminum castings and brought forth some of the difficulties encountered and how they could be solved. This meeting was deemed to be a very important one, because aluminum is one of the major materials used in connection with the war production program.

Light Metals Discussed by Cincinnati Group

By Henry M. Wood,* Cincinnati, Ohio

"MAGNESIUM and Aluminum" was the subject discussed by H. B. Lamker, superintendent of foundries, Wright Aeronautical Corp., Patterson, N. J., at the March 8 meeting of the Cincinnati Chapter held at the Cincinnati Club. Chairman Frank Hutchinson, Reliance Foundry Co., Cincinnati, presided. David L. Longeuville, Wright Aeronautical Corp., Cincinnati, introduced the speaker of the evening. Mr. Lamker discussed aluminum and magnesium castings from three points of view, namely, what makes good aluminum and magnesium castings, defects in castings and how to avoid them, and post-war prospects.

C. E. Westover, executive vice president, A.F.A., was present at the meeting and spoke about the coming A.F.A. annual meeting in St. Louis. He also outlined the history of the founding of A.F.A. and called upon members to cooperate for the benefit of the foundry industry.

The February 10 meeting of the Cincinnati Chapter was a special meeting over which E. H. King, Hill & Griffith Co., vice chairman of the chapter and chairman of the Program Committee, presided. This meeting was an O.P.A. Regional Clinic at which Maximum Price Regulation No. 125 (Revised) was discussed.

The open forum was addressed by O. S. McCorison, chief, Fabricated Products, for the non-ferrous section, O.P.A.; Jos. Meier, chief, Foundry Unit, Non-Ferrous Metals Branch, O.P.A.; Fred Wolf, Jr., chief legal counsel, Non-Ferrous Branch, O.P.A., all of Washington, D. C.; Morris Koblitz, non-ferrous price specialist, O.P.A. Regional Office, Cleveland; and H. A. Baker, district price officer, O.P.A., Cincinnati.

This meeting attracted wide interest as indicated by the fact that visitors were present from Pittsburgh, Buffalo, Chicago, Cleveland, Toledo, Indianapolis, Louisville, Columbus and Lima.

*W. W. Sly Mfg. Co. and Secretary, Cincinnati Chapter.

Barlow Talks at Buffalo on Inoculated Irons

By J. R. Wark,* Buffalo, N. Y.

THE March 5 meeting of the Western New York Chapter was held at Hotel Touraine, Buffalo, with R. T. Rycroft, Jewell Alloy & Malleable Co. Inc., Buffalo, chapter chairman, presiding. "Alloy Inoculations" was the subject discussed by the speaker, T. E. Barlow, Vanadium Corp. of America, Detroit. Henry Winte, metallurgist, Worthington Pump & Machinery Corp., acted as technical chairman and introduced the speaker.

With the aid of interesting slides and charts, Mr. Barlow gave the foundrymen many interesting thoughts and ideas on modified irons.

*Queen City Sand & Supply Co., and Secretary, Western New York Chapter.

Round-Tables Feature Chicago March Meeting

ROUND-TABLE discussions on steel, gray iron, malleable iron, non-ferrous and patterns featured the March 1 meeting of the Chicago Chapter held in the Chicago Bar Association with Chairman A. G. Gierach, American Manganese Steel Div., American Brake Shoe & Foundry Co., Chicago Heights, presiding.

Following the dinner and announcements, attention was called to the War Production

C. E. Bales, Ironton Fire Brick Co., Ironton, Ohio, Speaker, chats with Chairman Frank Waldenmeyer, A. J. Lindemann & Hoverson Co., and Wm. Brooks, Allis-Chalmers Mfg. Co., both of Milwaukee, after the refractories session at the Wisconsin Regional Conference.
(Courtesy John Bing, A. P. Green Fire Brick Co.)

Clinic in which the Chicago Chapter War Problems Committee was cooperating. The meeting broke up into five round-table discussion groups.

The steel division discussion was under the chairmanship of H. A. Forsberg, Continental Roll & Steel Foundry Co., East Chicago, Ind., and the subject was "Salvage and Substitute Materials." A. S. Klopf, Hansell-Elcock Co., Chicago, led the gray iron discussion on "Cores—Materials, Equipment and Results."

The malleable iron round table discussed "Current Sand Control Practices" under the chairmanship of B. C. Yearley, National Malleable & Steel Castings Co. "Melting of Non-Ferrous Metals" was the subject discussed at the non-ferrous session under the chairmanship of Chester Faunt, Christensen & Olsen Foundry Co. E. D. Mooney, Federated Metals Div., American Smelting & Refining Co., acted as discussion leader.

The round-table on patterns heard Arthur Koehler, Forest Products Laboratory, Madison, Wis., discuss "Substitution of Materials in Pattern Construction." The round-table was under the chairmanship of H. K. Swanson, Swanson Pattern & Model Works.

OPA Problems Discussed at Southern Calif.

By E. M. Hagener,* Los Angeles, Calif.

THE Southern California Chapter had the pleasure of hearing Dr. Arthur G. Coons, California State Price Officer from the Office of Price Administration, at its March meeting.

President Earl Anderson, Enterprise Iron Works, presided over the meeting and, after a few minutes of musical entertainment, Dr. Coons divulged some of the problems encountered by the Office of Price Administration. To bring the subject closer to the foundrymen, Harvey Roney, Section Chief within the Price Division, and also W. H. Buckingham, Price Attorney of the local district, held open forum, answering many questions that were sent in by foundrymen and taking up problems of local interest.

Through the courtesy of the Aluminum Company of America, the film "How to Machine Aluminum" was shown.

*General Metals Corp., and Secretary, Southern California Chapter.

N. Cal. Chapter Holds Two February Meetings

By G. L. Kennard,* San Francisco, Calif.

THE regular February meeting of the Northern California Chapter was held on Feb. 12 at the Athens Club, Oakland. The few announcements were quickly made to conserve time, as the audience consisted of several visitors who had driven 50 miles to make their first appearance at the Chapter meeting and to benefit by the splendid program.

F. A. Mainzer, Pacific Brass Foundry of San Francisco, Chapter Chairman, was in charge, supported by Vice-Chairman H. A. Bossi, H. C. Macaulay Foundry Co., and several past chairmen. After necessary time-out to allow for personal introductions, the meeting was turned over to Program Chairman Serge P. Kovaleff who introduced the speaker, Charles B. Schureman, F. E. Schundler Co., Joliet, Ill., technical consultant on foundry sands and molding practices. Mr. Schureman's subject was "Synthetic Sand, Its Properties and Utilization."

The presentation was made, in part, by the use of a blackboard which added interest and held the close attention of everyone. Questions and answers proved that the subject could be treated for hours; as it was, the meeting continued beyond the usual time for adjournment.

Non-Ferrous Meeting

On February 26, Northern California Chapter held its ninth meeting in a period of six months, making good the promise of a program for Non-Ferrous Foundrymen. Our speakers were both local men, devoting all their energies to getting more and better results from the efforts to produce castings for the armed forces.

George W. Stewart, Supt.,

*Northern California Foundrymen's Institute and Secretary-Treasurer, Northern California Chapter.

Registration at the Birmingham District Regional Conference Held Feb. 19.
(Courtesy W. W. McCullough, American Cast Iron Pipe Co.)

Pacific Brass Foundry of San Francisco, detailed some of the problems he had worked out to overcome diffculties in meeting exacting demands for castings of type and size which were new to their plant. He paid tribute to his workers and emphasized the fact that a loyal working force is the greatest asset a superintendent has.

Our second speaker, D. T. Bergman, Manager, San Francisco Brass Die Casting Company, stated he was not a foundryman, knew few of their terms, but as for problems, he had plenty of his own. He gave a short historical sketch of the die casting business and of the several methods used. As proof of what he had accomplished in his plant, he passed around for examination several small samples and had a table display of larger ones. Considerable comment and questioning resulted.

As a finale to a good program, two reels were shown of Beardsley Piper Co. "Sandslinger," the operation of which was new to most of the group, both from the points of efficiency and the ability of the girl operator to guide the machine in its action.

Pittsburgh Founders Honor T. A. Reynolds

By R. L. Hartford,* Pittsburgh, Pa.

MARCH meeting of the Pittsburgh Foundrymen's Association was devoted jointly to a tribute to T. A. Reynolds and to non-ferrous foundry practice. Mr. Reynolds, president of the association in 1932 and 1933 and for the past 10 years a member of the executive committee, has retired as superintendent, McConway & Torley Corp., Pittsburgh, following 30 years' service. C. J. Scheckhaus, past president of the association, outlined Mr. Reynolds' career and paid a fitting tribute to his untiring efforts on behalf of the Pittsburgh Foundrymen's Association.

As speaker of the evening, J. N. Kelly, Linhart non-ferrous foundry, Westinghouse Electric & Mfg. Co., spoke on the production of Navy bronze castings in the non-ferrous industry. Mr. Kelly cited the importance of proper procedure for making test bars and outlined several methods which have been found satisfactory. The methods used in preparing the more prominent Navy bronzes in the Westinghouse foundry were outlined in detail by the speaker, paying particular attention to methods of gating and risering. Physical properties arising from slight variations in analyses were outlined by Mr. Kelly in giving the result of intensive research carried out in his shop over an extended period.

*The Foundry.

(Courtesy John Bing, A. P. Green Fire Brick Co.)

Left to Right—G. J. Landstrom, Sundstrand Machine Tool Co., Rockford, Chapter Director and Past Chairman; James Gibney, Vibracast, Inc., New York, Speaker at the Feb. 9 meeting of the Northern Illinois-Southern Wisconsin Chapter; Max J. Reuteler, Fairbanks, Morse & Co., Beloit, Chapter Chairman; and Roy D. Baysinger, Geo. D. Roper Corp., Chapter Vice Chairman.

Quad City Discusses Cupola Operation

By H. L. Creps,* Moline, Ill.

THE Quad City Chapter of A.F.A. held its March 15 meeting at the Blackhawk Hotel, Davenport, Iowa, with Chairman Alex Matheson, French & Hecht, Inc., presiding. Chairman Matheson, prior to the main talk, announced the appointment of the following members as the 1943 Nominating Committee: H. Bornstein, Deere & Co., Moline, Chairman; A. H. Putnam, A. H. Putnam Co., Rock Island, Ill.; and John H. Ploehn, French & Hecht, Inc., Davenport, Iowa. The committee will bring in its report at the April meeting.

Cupola operation was the topic of discussion for the evening. Fred J. Walls, International Nickel Co., Inc., Detroit, was the speaker and was introduced by Mr. Bornstein. Mr. Walls illustrated his talk with pictures covering all phases of cupola operation and control.

After a brief review of the history of cupolas, he mentioned various ways of improving practice and outlined methods for converting critical raw materials. "Pay attention to your cupola and you can perform miracles," he said. He advised considering the melting unit in foundries as a chemical laboratory and treating it accordingly.

In a discussion of the construction of new shops, the speaker said that the cupola must be considered as the most important machine in the foundry and advised giving it plenty of room when the building is being constructed. Mr. Walls discussed the use of forehearth and insulated ladles at length. A lively question period followed the discussion.

*Frank Foundries Corp. and Recording Secretary, Quad City Chapter.

Chicago War Problems Committee Cooperates

THE Chicago Chapter War Problems Committee, under the chairmanship of E. R. Young,

Climax Molybdenum Co., Chicago, cooperated with the War Production Board, U. S. Navy, U. S. Army Ordnance, and 19 other organizations in staging the First War Production Clinic to be held in that area. The purpose of the clinic was to assist in solving problems having to do with the production of war materials.

Jim Bowers, American Cast Iron Pipe Co., and Wayne Nelson, Young & Van Supply Co., laugh at a good joke.

The Chicago Chapter War Problems Committee functioned to provide series of four discussion groups on foundry products. The groups were devoted to the production and use of aluminum and magnesium castings, cast iron and malleable iron castings, brass and bronze castings, and steel castings. Each session was presided over by chairmen familiar with the types of castings being discussed, assisted by a group of discussion leaders chosen because of their specific knowledge of certain phases of foundry operations.

The total attendance at the clinic was approximately 1500, of which nearly 300 attended the sessions on castings.

St. Louis Chapter Holds Roundtables

By J. H. Williamson,* St. Louis

THE February 11 meeting of the St. Louis District Chapter was held at the DeSoto Hotel with Chairman C. B. Shanley, Semi-Steel Castings Co., presiding.

E. A. Goerger, City Pattern & Model Co., chairman of the chapter apprentice training committee, requested that reports on entries to the National apprentice training contest be turned in as soon as possible. He stated that there must be at least three entries in each class. W. A. Zeis, Midwest Foundry & Supply Co., chairman of the membership committee, introduced three new members. L. J. Desparois, Pickands, Mather & Co., chairman of the general committee, War Production Foundry Congress, reported that the complete general committee had now been set up and that all subcommittees would meet on or before March 1.

Mr. Shanley announced that due to the sudden illness of our scheduled speaker, Pat Dwyer, engineering editor, *The Foundry*, Cleveland, it was necessary to make a last minute change in the program to one of a round table nature. Steel foundrymen, led by Luther Kleber, General Steel Castings Corp., with Fred Riggan, Key Co., as discussion leader, discussed the effect of various ingredients on high temperature properties of sand. Gray iron foundrymen, under the chairmanship of R. A. Jacobsen, Carondelet Foundry Co., with W. E. Illig, Banner Iron Works, as discussion leader, exchanged experiences on various problems, while the non-ferrous session, presided over by A. L. Hunt, National Bearing Metals Corp., with J. F. Gilbert, Gilbert Brass Foundry Co., acting as discussion leader, discussed problems related to that branch of the industry.

*M. A. Bell Co., and Secretary-Treasurer, St. Louis District Chapter.

Metropolitan Does Fine Work Promoting Foundry Education

THE Metropolitan Chapter is doing an outstanding work in its area in promoting foundry education, not only among the foundrymen of the district but also in the technical schools there. T. D. Parker, chapter treasurer, who also is acting as chapter representative on the National Committee on Cooperation with Engineering Schools, reports that through that committee, with his assistance, and in cooperation with Stevens Institute of Technology, Hoboken, N. J., a series of free lectures has been set up and now is in operation there.

The development of this interest in foundry engineering by Stevens Institute should provide other chapters with ideas on how similar programs can be developed in their respective areas in cooperation with engineering schools. One of the activities of the Committee on Cooperation with Engineering Schools is the sponsorship of an essay contest among students in colleges and universities throughout the country and Canada. As Metropolitan Chapter representative on this committee, Mr. Parker contacted engineering institutions in the Metropolitan Chapter area concerning interest in the contest.

As a result of these discussions, Mr. Parker talked with Dr. Alfred Bornemann, Associate Professor of Chemical Engineering, Stevens Institute of Technology, on the foundry industry and it developed that there was a need for instruction in foundry subjects. Several companies were contacted and it was found that, provided a suitable course could be offered, a sufficient enrollment could be expected. As a result, Mr. Parker offered the assistance of the Metropolitan Chapter in formulating such a course and the free course in "The Fundamentals of Foundry Engineering" mentioned above began. As an indication of the interest in foundry subjects, enrollment exceeded expectations with over 100 signed up.

Not satisfied with this accomplishment, the chapter also sponsored a lecture course on "Speed the War Through Good Casting Design." The course consisted of four lectures by experts in various metals on the properties and selection of cast metals, intelligent design and expediting Army-Navy approval of redesigns.

Abstracts

NOTE: The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman*, from current technical and trade publications.

When copies of the complete articles are desired, photostat copies may be obtained from the Engineering Societies Library, 29 W. 39th Street, New York, New York.

Analysis

OXYGEN. *(See Steel.)*

Acceptance Tests

LIGHT ALLOYS. *(See Inspection.)*

SPECTROGRAPHIC. *(See Steel.)*

Cast Iron

ELECTRIC FURNACE MELTING. *"Electric Furnace in the Manufacture of High-Duty Cast Iron,"* T. R. Twigger, *Foundry Trade Journal,* vol. 69, No. 1377, January 7, 1943, pp. 3-7. The author lists the advantages and disadvantages of electric furnace melting as compared with normal cupola melting. He briefly describes the direct arc, indirect arc, induction, and resistance types of electric furnaces and points out their limitations. The author describes two principal methods in which electric furnace operation is utilized to produce special composition cast irons: (1) Adding a small amount of special electric furnace metal to a balance of cupola metal, and (2) Transferring molten metal from a cupola to an electric furnace and adding alloying elements in the electric furnace (commonly known as "duplexing"). Both methods will give a continuous supply of special composition irons while the cupola melts only one standard mixture.

EFFECTS OF PHOSPHORUS. *"Some Effects of Phosphorus on Cast Iron,"* Michael Fielden, *Iron and Steel,* vol. XVI, No. 6, February, 1943, pp. 214-217. The author describes the form in which phosphorus exists in cast iron and discusses the effects of increasing and excessive amounts of phosphorus. An increase in the amount of phosphorus in cast iron does the following things: (1) Reduces the amount of combined carbon necessary to produce a pearlitic matrix; (2) Increases the depth of a test chill; however, this varies somewhat with the condition of the iron as poured, cooling characteristics of the mold, silicon content, and size of the casting cross-sections; (3) Increases the fluidity of molten iron. Although the increased fluidity in itself may be an advantage, the resultant rapid passage of the molten iron through the cupola may be undesirable; (4) Prolongs the freezing range, thereby causing defects of a porous nature in castings; and (5) Up to 0.9 per cent, improves the rigidity of castings during annealing; over 0.9 per cent, reduces strength at high temperatures. Excessive phosphorus is responsible for the following conditions: (1) Fire-cracking; (2) "Microchill" or the occurrence of minute formations of free cementite which delay graphitization; (3) Phosphide "sweat" or the appearance of phosphorus-rich globules of iron on the surface of a casting; (4) Hard spots or phosphorus-rich globules forming within a casting; and, possibly, (5) Formation of internal chills in iron which has been improperly melted.

SHRINKAGE. *"Theory of Shrinkage in Gray Cast Iron,"* George A. Timmons, *The Foundry,* vol 71, No. 1, January, 1943, pp. 80-81, 165-169. The author describes experiments performed to study shrinkage in gray cast iron, using as a test specimen a 4-in. cube cast in a dry sand mold. This cube was believed to duplicate conditions found in certain locations in a large motor block casting. The outline of principal shrinkage cavities was revealed by cutting vertical sections through the center of the cube. However, this did not always give a true picture of the total volume of voids within the cube. Therefore the total volume of voids was determined indirectly. The cube was weighed, first in air and then submerged in water. The difference in weights in water and in air was equal to the weight of the water displaced by the cube. The weight of water displaced divided by the density of water at the water temperature was equal to the volume of water displaced, which in turn, was equal to the volume of cast iron in the cube. A 1-in. cube cut and ground from one corner of the test cube was considered to be representative of sound iron, and its density was determined. Values thus obtained were used in calculating the volume of voids within the cube. Later on it was learned that 1-in. cubes taken from other than corner locations of the test cube were more truly representative of sound metal in various types or sections of iron castings. Within the composition range studied, the following effects were observed: (1) Varying phosphorus from 0.01 to 0.74 per cent increased void volume; (2) Varying manganese from 0.52 to 1.00 per cent decreased void volume. From 1.00 to 1.32 per cent it increased shrinkage of a small order; (3) Deoxidizers tended to increase porosity; (4) Varying carbon from 3.01 to 3.44 per cent, silicon from 1.39 to 2.85 per cent, and sulphur from 0.04 to 0.15 per cent had little effect on void volume; and (5) Increasing pouring temperature from 2400° F. to 2850° F. increased void volume. Practices which reduced tendency toward shrinkage included (1) reduction in elements which increase the freezing range, (2) reduction in pouring temperature, (3) gating through light sections or risers, (4) controlling pouring rates, and (5) use of chills.

Duplexing

ELECTRIC FURNACE. *(See Cast Iron.)*

Furnaces

ELECTRIC MELTING. *(See Cast Iron.)*

Inspection

RADIOGRAPHY. *"Acceptance Standards for Light Alloy Castings,"* W. H. Burroughs, *Metal Progress,* vol. 43, No. 2, February, 1943, pp. 227-228. Acceptability of a light alloy casting should not be decided without taking into account the major factors in acceptability — design load, simulated load test, and type and location of defect. Knowledge of design load should include magnitude of load, type of loading, and method of applying the load. Simulated load tests should be run to destruction on any part under conditions which simulate actual service conditions as nearly as possible. Defects may be either general or localized. General defects include blowholes, dross or oxide inclusions, segregations, gas porosity, and microshrinkage. Localized defects include cracks, shrinkage, cold shuts, and misruns. General defects are not usually as serious as localized or directional defects. Although standards may be adopted for the acceptability of a particular design of casting, no standards may be adopted which will cover all designs of castings.

SCREENING. *"Screening Equipment for X-Ray Examination of Light Alloy Castings,"* R. J. M. Payne, *The Metal Industry,* vol. 63, No. 3, January 15, 1943, pp. 34-36. Screening, or fluoroscopic examination, of light metal castings as a means of detecting large-sized defects, such as blowholes, shrinkage cavities, and inclusions, is of particular value when large numbers of castings have to be inspected. However, screening will not disclose fine defects such as cracks, cold shuts, and fine porosity. Therefore screening is frequently used in conjunction with radiograph inspection of production castings. For example, all castings may be screened while only a portion of the castings may receive radiographic inspection. Any equipment designed for routine screening should (1) safeguard the operator, (2) produce the sharpest possible shadow on the fluorescent screen (3) permit adequate, facile manipulation of the casting, and (4) permit rapid inspection. The author fully describes equipment designed and used in his plant, which meets the four requirements for routine screening equipment.

Light Alloys

ACCEPTANCE TESTS. *(See Inspection.)*

Melting

ELECTRIC FURNACE. *(See Cast Iron.)*

SILICON BRONZES," E. G. Jennings and Harold J. Roast, *Iron Age,* vol. 150, No. 3, July 16, 1942, pp. 54-55. Copper-silicon-iron bronzes, of excellent physical properties and containing no tin, are being frequently specified in place of red brass, gun metal, phosphor bronze and similar

alloys. Article describes the general method of producing such silicon bronzes in either green or dry sand molds, and outlines the molding technique. In charging a special hardener is used, charged alternately with the copper. In molding, a fairly open sand is used, such as Albany sand to A.F.A. fineness 1-F. Any good core sand mixture is satisfactory, with plenty of permeability and sufficiently soft to take care of heavy shrinkage areas of the mold. Shrinkage of the alloy is considered half way between gun metal and manganese bronze. Large castings are poured between 1900 and 2000° F., small castings from 2050 to 2200° F. The alloys machine readily, similar to mild steel, gun metal or other non-leaded bronzes, and are readily welded with rods or electrodes of the same composition, by oxyacetylene or electric arc methods. Wide variations in physical properties are obtainable by small additions of such elements as lead, zinc, aluminum and nickel.

Phosphorus

EFFECT IN CAST IRON. *(See Cast Iron.)*

Radiography

LIGHT ALLOYS. *(See Inspection.)*

Shrinkage

CAST IRON *(See Cast Iron.)*

Silicon Bronze

(See Non-Ferrous.)

Steel

HARDENABILITY. *"The Effect of Silicon on Hardenability,"* Walter Crafts and John L. Lamont, *Metals Technology,* vol. 10, No. 1, January, 1943. Previous work by Grossmann indicates that the multiplying factor of the effect of silicon on the hardenability of steel increased to a lesser degree as the amount of silicon present increased. Work done in the Union Carbide and Carbon Research Laboratories, Inc., indicated that the silicon multiplying factor increased directly in proportion to the amount of silicon present. Crafts and Lamont conducted further studies, using Jominy hardenability test specimens machined from laboratory prepared steels in three ranges of compositions. Samples were chemically analyzed and their grain size was determined microscopically. Their work included a calculation of the multiplying factor of acid-soluble aluminum, rather than the total aluminum which Grossmann used, and a recalculation of the multiplying factors of manganese and silicon. From their studies, the authors drew the following conclusions: (1) Multiplying factors for the hardenability conferred by silicon, manganese and acid-soluble aluminum are applicable within the range of 0.20 to 0.55 per cent carbon, 0.50 to 1.75 per cent manganese, 0.20 to 2.00 per cent silicon, and up to 0.40 per cent acid-soluble aluminum; (2) The multiplying factor for silicon is directly proportional to the silicon content up to at least 2 per cent; and (3) Grossmann's principle of calculation of hardenability by applying multiplying factors for the various alloying elements present in steel was confirmed by their studies.

METALLOGRAPHY. *"Anodic Treatment of Carbon Steels,"* Robt. L. Imboden and Robt. S. Sibley, *Canadian Metals and Metallurgical Industries,* vol. 5, No. 10, October, 1942, pp. 298-300, 319. Paper presented before 1942 general meeting, Electrochemical Society. Description and advantages of electrolytic method of preparing carbon steel specimens for microscopic examination, called electropolishing. In the process, the sample is made the anode in an electrolytic cell, and when current is passed through, metal is removed from the anode leaving it in a highly polished condition with crystal faces exposed. Specimen then can be etched chemically or electrolytically. The theory of electropolishing is detailed, various types of electropolishing baths described, and advantages of the method over mechanical polishing enumerated. Two-dimensional metallographic study is strongly emphasized for all types of steel.

OXYGEN. *"Rapid Analysis of Oxygen in Molten Iron and Steel,"* Gerhard Derge, *Metals Technology,* vol. 10, No. 1, January, 1943. In the past the development of a simple method of sampling steel and a quick method of determining its oxygen content has been impeded by (1) the rapidity of the $C + FeO \quad Fe + CO$ reaction, and (2) the unreliability of ordinary chemical methods of analysis for oxygen, other than the vacuum fusion method. Indirect methods depending upon chemical equilibria are not entirely satisfactory because of the uncertainty of degree to which any equilibrium is approached in steel furnaces. The author has described a method whereby the percentage of oxygen can be determined within 10 minutes of the time the sample is poured. A sample is dipped from the bath with a well-slagged spoon without disturbing the carbon-oxygen equilibrium of the metal, and is poured in a small, split, wedge-shaped mold of copper which so chills the sample that it can be immediately removed with bare hands. From 5 to 10 grams of metal are removed from the bottom of the wedge and heated in a simplified vacuum-fusion apparatus. The volume of the gas evolved on heating is measured, and necessary corrections, determined from a previously plotted curve, are applied. The author fully describes the method of sampling and the simplified vacuum-fusion apparatus, and favorably compares the results obtained by this method with results obtained by methods now in use.

Testing

REFRACTORY MORTARS. *"Control Testing for Consistency of Refractory Mortars,"* Earl C. Petrie and D. W. Kocher, *Journal of American Ceramic Society,* vol. 25, No. 15, November 1, 1942, pp. 459-463. Paper presented at 1942 annual meeting American Ceramic Society. Various methods of determining the consistency of mortars are discussed, and data are included to show the test results obtained on different instruments. A description is given of a modified Vicat needle which may be used for the control of consistency during the manufacture of wet type, cold-setting mortars.

X-Ray

LIGHT METAL. *(See Inspection.)*

April Chapter Meeting Schedule

April 12

Cincinnati
Cincinnati Club
P. E. ANDERSON
Harnischfeger Corp., Milwaukee
Movies; Cupola Charging; Unfinished Rainbows

✦

Western Michigan
Ferry Hotel, Grand Haven
D. B. REEDER
Electrometallurgical Co.
"Acid Electric Furnace Practice"

✦ ✦

April 13

Northern Ill.-Southern Wis.
Beloit, Wis.
John Kane, American Air Filter Co., Louisville, Ky.
"Hygiene Problems"

April 15

Detroit
Horace H. Rackham Educational Memorial
ROUND-TABLE MEETINGS
Aluminum, Gray Iron, Magnesium, Steel

✦ ✦

April 16

Eastern Canada-Newfoundland
Mount Royal Hotel, Montreal
C. A. SANDERS
American Colloid Co., Chicago
"Prevention of Casting Defects Due to Sand"

✦

Birmingham
Tutwiler Hotel, Birmingham
HAROLD J. ROAST
Canadian Bronze Co., Ltd., Montreal.
"Silicon Bronze Castings"

Wisconsin
Hotel Schroeder
Discussion by War Manpower Commission and Wisconsin Industrial Commission
"Women in Industry"

✦ ✦

April 19

Quad City
Fort Armstrong Hotel, Rock Island, Ill
C. F. JOSEPH
Saginaw Malleable Iron Div., General Motors Corp., Saginaw.
"Malleable Iron"

✦ ✦

April 22

Southern California
Elks Club
Los Angeles

✦ ✦

No Meetings
Twin City

✦

Chesapeake